Nos. 2014-1612, -1655

United States Court of Appeals for the Federal Circuit

PARKERVISION, INC., a Florida corporation,

Plaintiff-Appellant,

v.

QUALCOMM INCORPORATED, a Delaware corporation,

Defendant-Cross-Appellant.

Appeals from the United States District Court for the Middle District of Florida in No. 3:11-cv-00719-RBD-JRK, Judge Roy B. Dalton, Jr.

NON-CONFIDENTIAL RESPONSE AND PRINCIPAL CROSS-APPEAL BRIEF OF DEFENDANT-CROSS-APPELLANT QUALCOMM INCORPORATED

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CERTIFICATE OF INTEREST

Counsel for Defendant-Cross-Appellant Qualcomm Incorporated certifies the following:

- 1. The full name of every party or *amicus* represented by me is: Qualcomm Incorporated.
- 2. The name of the real party in interest (if the party named in the caption is not the real party in interest) represented by me: None.
- 3. All parent corporations and any publicly held companies that own 10 percent or more of the stock of the party or *amicus curiae* represented by me are: None. No publicly traded company owns 10% or more of Qualcomm Incorporated's stock, and it has no parent companies.
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Dated: November 20, 2014 /s/ Timothy S. Teter

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CONFIDENTIAL MATERIAL DELETED

Material has been deleted from pages 14, 15, 28, 41, 42, 46, 67, 90, and 92 of Qualcomm's Nonconfidential Response and Principal Cross-Appeal Brief. The material from pages 15, 28, and 90 was deleted because it references, or is based on, portions of the record ParkerVision designated as confidential. The material on these pages relates to information regarding ParkerVision technological and business development efforts. The material from pages 14, 41, 42, 46, 67, 92 was deleted because it references, or is based on, confidential Qualcomm information. This information relates to the confidential details of the designs of the accused technology in this case, which are protected by Qualcomm as proprietary and confidential information.

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STATEMENT OF RELATED CASES

ParkerVision has filed two cases against Qualcomm. The first case—

ParkerVision, Inc. v. Qualcomm Incorporated, No. 11-0719 (M.D. Fla.)

("ParkerVision I")—is the subject of this appeal. The second case—

ParkerVision, Inc. v. Qualcomm Incorporated, Qualcomm Atheros, Inc., HTC

Corporation, HTC America, Inc., Samsung Electronics Co., Ltd., Samsung

Electronics America, Inc., and Samsung Telecommunications America, LLC,

No. 6:14-cv-00687 (M.D. Fla.) ("ParkerVision II")—was filed the day of the

JMOL hearing in ParkerVision I and involves patents related to the patents at
issue in this appeal. The resolution of this appeal may impact

noninfringement, invalidity, and other issues in ParkerVision II.

No other appeal in or from the same civil action is before this Court or any other appellate court.

STATEMENT OF JURISDICTION

Qualcomm agrees with ParkerVision's jurisdictional statement.

Qualcomm timely filed a Notice of Appeal on July 15, 2014, following entry of final judgment on June 23, 2014. This Court has jurisdiction over Qualcomm's cross-appeal under 28 U.S.C. § 1295(a)(1).

I. STATEMENT OF THE ISSUES

ParkerVision brought this action against Qualcomm—a long-time leader in cellular technologies—claiming that Qualcomm infringed ParkerVision's patents for "down-converting" a high-frequency carrier signal to a low-frequency baseband signal. ParkerVision never sold a cellular chip, but claimed that Qualcomm owed it almost half a billion dollars.

The issues presented by ParkerVision's appeal are:

- 1. Whether the district court properly granted JMOL of noninfringement and ordered a new trial in the alternative where the documentary evidence established, and ParkerVision's own expert conceded, that none of the accused products meet the "generating" limitations present in every claim.
- 2. Whether the district court properly held, as an additional and independent basis for the judgment, that Qualcomm's 50% duty-cycle products (the majority of the accused designs) do not meet the "sampling" limitations present in every claim.
- 3. Whether the district court's judgment should be affirmed on the alternative ground that Qualcomm cannot be liable for inducement as a matter of law.

The issues presented by Qualcomm's cross-appeal are:

- 1. Whether the district court should have granted Qualcomm JMOL of anticipation (or, at the very least, ordered a new trial), given that the prior art described the claimed down-conversion technique and architecture.
- 2. Whether the district court should have conditionally granted JMOL on damages (and a new trial), where ParkerVision claimed a 50-50 split of nearly all of Qualcomm's receiver profits, citing "Nash Bargaining" and an expert opinion that contradicts this Court's damages precedent.

II. PRELIMINARY STATEMENT

This case involves ParkerVision's claimed invention for "down-converting" a high-frequency radio carrier signal (transmitted over the air and received by an antenna) to a low-frequency baseband signal (used within consumer electronics). At trial, ParkerVision ignored the scientific evidence that established non-infringement and told the jury irrelevant "stories about people." ParkerVision argued that Qualcomm must have implemented ParkerVision's ideas because Qualcomm considered working with ParkerVision many years before. Focusing on old emails and neglecting the technical facts, ParkerVision won a short-lived victory at trial, but its case had three major flaws.

First, Qualcomm's receivers use a traditional prior art approach, not The claimed invention down-converts (i.e., the ParkerVision patents. generates the baseband) by using energy from the high-frequency carrier signal transferred into a storage device (a capacitor). But as Qualcomm's design documents show, Qualcomm chose a traditional prior art "doublebalanced mixer" approach. Double-balanced mixers, which had been used for many years before the alleged invention, do not use a capacitor to generate the low-frequency baseband signal. ParkerVision recognized that doublebalanced mixers are fundamentally different, regularly distinguished them from the claimed invention, and disparaged them as an inferior design that requires extra transistors. At trial, ParkerVision did not dispute that every accused Qualcomm receiver used a double-balanced mixer, and its expert repeatedly conceded that Qualcomm's double-balanced mixers generate the low-frequency baseband signal. As the district court held, those admissions were fatal to ParkerVision's case.

ParkerVision offered no evidence to counteract these admissions. It did not test the accused products and abandoned the irrelevant and faulty simulations its expert had performed before trial. The district court properly granted JMOL of noninfringement, recognizing that ParkerVision's "story

about people" could not trump the admitted technical evidence of how the products actually worked.

Second, the prior art Weisskopf and DeMaw references anticipate the asserted claims. Although ParkerVision offered no rebuttal and the district court found Qualcomm's invalidity arguments compelling, it did not grant JMOL of invalidity. Instead, the district court accepted ParkerVision's argument that the jury could disbelieve uncontradicted anticipation evidence. ParkerVision's invalidity arguments were smokescreens, internally inconsistent, and unsupported. The jury had no basis to disregard the references themselves, or the clear and unrebutted expert testimony about them.

Third, ParkerVision's damages theory was fatally deficient. ParkerVision presented an accountant, Paul Benoit, who invoked Nash bargaining but simply assumed that Qualcomm would have given ParkerVision 50% of nearly all of Qualcomm's profits on the accused receivers. ParkerVision's improper damages demand tainted the verdict and cannot be reconciled with this Court's damages precedent or common sense.

Case: 14-1612 Document: 54 Page: 17 Filed: 11/20/2014

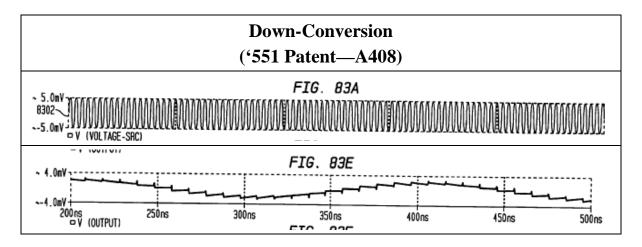
III. STATEMENT OF THE CASE

A. The Claimed Technology, Prior Art, and Accused Products.

Cell phones receive high-frequency signals from cell towers. Before cell phones extract the information from the received signals, they "down-convert" the *high-frequency* over-the-air signals to *low-frequency* signals called "baseband signals." (A436, Col. 1:23-30.) The patents-in-suit relate to a particular method for "down-conversion."

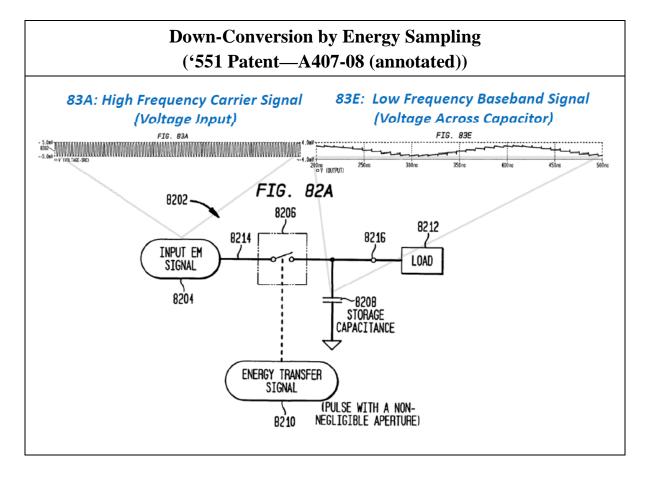
1. Down-Conversion Technology.

Frequency conversion is a commonplace feature of wireless communications. At the transmitter side, a low-frequency baseband signal is "up-converted" to a higher carrier frequency for over-the-air transmission. (A443, Col. 15:29-36.) At the receiver, the process is reversed—the high-frequency carrier signal (Fig. 83A) is "down-converted" to a low-frequency baseband signal (Fig. 83E). (A436, Col. 1:23-30; A408; A469.)



2. The Asserted Patents.

The patents-in-suit describe a particular way for down-converting a received signal that ParkerVision terms "energy sampling." Using a single switch (8206 in FIG. 82A), an energy sampler transfers energy from the carrier signal to a storage capacitor (storage capacitance 8208). (A407.) The voltage across the capacitor is the down-converted signal. (A408.) Fig. 83E shows a down-converted signal formed by energy transferred from the input EM signal. (A469, Col. 67:65-68:2.)



The asserted claims all recite ParkerVision's alleged "energy sampling" invention. The capacitor receives non-negligible energy from the high-frequency carrier signal, and uses that energy to generate the low-frequency baseband signal. For example, Claim 23 of the '551 patent recites:

23. An apparatus for *down-converting a carrier* signal to a lower frequency signal, comprising:

an energy transfer signal generator;

a switch module controlled by said energy transfer signal generator; and

a storage module coupled to said switch module;

wherein said storage module receives non-negligible amounts of energy transferred from a carrier signal at an aliasing rate that is substantially equal to a frequency of the carrier signal plus or minus a frequency of the lower frequency signal, divided by n where n represents a harmonic or sub-harmonic of the carrier signal, wherein a lower frequency signal is generated from the transferred energy.

(A493 (emphasis added).)¹

The claims thus require the circuit to down-convert by "generating" the low-frequency signal (the baseband) using energy stored in the down-

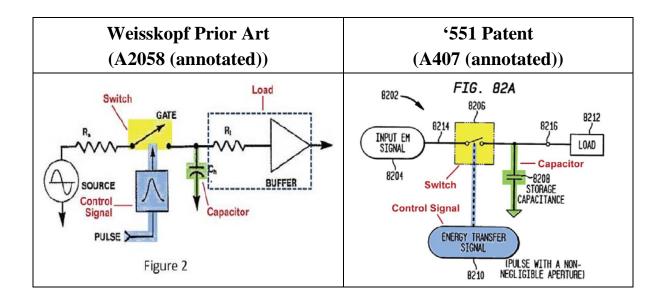
¹ ParkerVision acknowledges that "all [asserted claims] are directed to down-converting by energy sampling and each includes elements that generally correspond to the 'generating' element." (BB20.) ParkerVision further notes that the differences in claim language do not have "a material effect" on the issues on appeal. (BB20.)

converter's storage device (the capacitor). As inventor Sorrells testified, ParkerVision's asserted claims require "the accused products [to] transfer energy from the carrier signal into the storage device" and "generate the baseband from the energy that was transferred into the storage device." (A10458:2-10.) If the accused products create the baseband signal "somehow or somewhere other than from the carrier signal energy that has been stored in the capacitor," then those accused products would not infringe. (A10460:1-5.)

3. Prior Art Down-Conversion Technology.

a. Samplers.

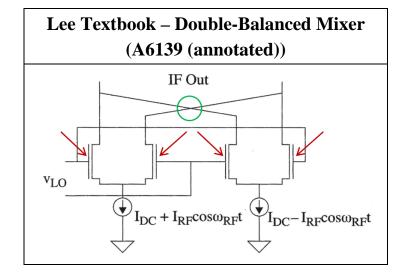
ParkerVision did not invent down-conversion, a basic function of radio receivers. (A10261:1-2.) Various down-conversion methods have long existed, and prior art down-converters known as "samplers" used the same components in the same way as ParkerVision's energy sampler. As depicted below, the Weisskopf paper, published years before ParkerVision's invention, described the same architecture and sampling method, but the Patent Office did not consider it. (A2057-63; A32; A11236:19-22.)



b. Double-Balanced Mixers.

The prior art also included a different device for down-conversion called a "double-balanced mixer." As ParkerVision's expert testified, "double balanced mixers had been making and generating basebands long before ParkerVision ever came up with this invention." (A10988:4-7.) Unlike energy samplers, double-balanced mixers down-convert without using a storage device, such as a capacitor, to generate a low-frequency signal. Instead, double-balanced mixers use balanced pairs of transistors and crossing paths to "mix" the high-frequency carrier signal together with a locally-generated oscillator signal in a way that both generates a low-frequency signal and eliminates the RF carrier and local oscillator signals. (A5586; A6139; A6148-49; A10949:9-14.) The well-known Lee textbook illustrates a double-

balanced mixer, which has no capacitor/storage device. (A6139.)



(The red arrows indicate the balanced pairs of transistors. The green circle indicates where the paths cross.) The prior art included many examples of double-balanced mixers. (*E.g.*, A11126:1-2 (citing A5557-58, Fig. 1); A5641-47.)

ParkerVision's witnesses testified that the patents-in-suit do not describe double-balanced mixers "in any way." (A10396:9-12; A10952:17-22.) To the contrary, ParkerVision believed that double-balanced mixers were "an inferior foundation." (A10671:4-16; A10418:16-10419:14.) ParkerVision emphasized that its energy samplers "are built from a fundamentally different approach" than the "traditional approach [that] employs an 'engine' known as a mixer." (A5602; A10672:8-10673:1;

A10674:1-11.) ParkerVision argued that its energy samplers—unlike double-balanced mixers—did not need balanced pairs of transistors. (A10419:6-14.) Even within the company, ParkerVision emphasized that energy samplers are *not* mixers. (A10678:1-10680:7 (ParkerVision "inventors were outraged" if employees referred to energy sampler as "mixer"); A5605-06 ("chastise [engineer] for using the 'm' word").)

4. The Accused Qualcomm Receivers.

Established in 1985, Qualcomm is the world's foremost developer of CDMA technology and one of the world's largest producers of chipsets used for cellular communications. (A8518; A8528.) Qualcomm's complex MSM "baseband" chips are the heart of many modern smart phones, and Qualcomm makes receivers to operate with them. (A8523-24; A11829:9-25; A12155:12-24.)

Like every receiver, Qualcomm's receivers down-convert high-frequency carrier signals to low-frequency baseband signals. After investigating the options, Qualcomm concluded that using a double-balanced mixer would give performance "considerably better than" ParkerVision's energy sampler approach. (A6783.) Thus, for all of the accused products, Qualcomm chose "to adopt [a] conventional double balanced passive

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mixer"—not capacitors—to "downconvert[] the RF signal to baseband signal." (A1505; A1496.)

The current-mode² double-balanced mixers in the accused receivers, such as Magellan and Solo, use the same cross-coupling circuitry described in the Lee prior art:

Lee Textbook (A6139)	Magellan (Qualcomm) (A1505)	Solo (Qualcomm) (A6018)
$IF Out$ V_{LO} $I_{DC} + I_{RF} cos \omega_{RF} t$ $I_{DC} - I_{RF} cos \omega_{RF} t$		RFIN_MIXOUT_P

Like nearly every radio from the "antiquities" of RF communication, Qualcomm's receivers also contain filters. (A10447:15-10448:2; A5752.) And like most filters, Qualcomm's filters contain capacitors. This case focused on a particular filter called the "transmit" (TX) filter, which prevents

^{2.41. 6.1.}

² All of the accused products in this case operate in "current mode," "meaning that the signal input to the mixer is represented by varying the amount of electrical current input into the mixer." (A6997.) Each accused receiver transforms the incoming high-frequency carrier signal from a voltage signal (received by the antenna) into a current signal (down-converted by the double-balanced mixer). (*E.g.*, A2308 ("The incoming RF signals are converted into current"); A6017 ("The mixer is a passive double balanced current driven type.").)

Confidential Material Redacted

the outgoing transmit signal from jamming the receive path. A TX filter differentiates CDMA receivers from other cellular technologies. Before CDMA, cellular phones would *either* transmit *or* receive at a given instant in time—thus, the transmitted signal would not block or jam the received signal. But cell phones using the CDMA standards transmit and receive at the *same time* through a single antenna. Because radio signals diminish in power over long distances, the transmit signal, which leaks through the duplexer and into the radio's own receive path, is *millions* of times more powerful than the received signal. (A11023:6-10; A11032:6-9; A11039:12-25.)

A5689 (annotated)

Qualcomm designed its TX filters to absorb the massive TX jammer that would otherwise overwhelm the receiver. (A6018; A7636; A2315; A10993:21-24; A10998:25-10999:19; A11000:10-13; A11002:18-22.) The name describes the function; the "TX filters" filter out the TX jammer. The TX filter follows the double-balanced mixer, and does not down-convert.

Many of Qualcomm's non-CDMA products do not simultaneously transmit and receive. Lacking a TX jammer problem, they do not have or need a TX filter following the mixer. (A6998-99.)

B. The Jury Trial.

ParkerVision initially asserted more than 80 patent claims against dozens of diverse Qualcomm designs made and sold from 2006-2012. As ParkerVision explained, "we've basically accused every product that Qualcomm has made or introduced since the hypothetical negotiation date." (A5364:23-5365:1.) At trial, ParkerVision asserted eleven claims against nineteen designs. (A4n.2; A6n.6; A20.) The outcome hinged on whether those nineteen designs used double-balanced mixers to downconvert, or instead used energy samplers. ParkerVision did not dispute that every accused device used double-balanced mixers, but nonetheless argued that Qualcomm's TX filter was an energy sampler, not a filter.

1. Liability Phase.

a. The Accused Double-Balanced Mixers.

Because ParkerVision's alleged invention and a prior art voltage sampler look identical, even ParkerVision's witnesses testified that the presence of the same "building blocks" means nothing—it's "how they're used" that matters. (A10719:6-11.) This is even more true when trying to

compare the claimed invention to a double-balanced mixer design, which, unlike the prior art voltage sampler, does not share the same basic circuit layout as the ParkerVision energy sampler. As Mr. Sorrells testified, merely knowing that a circuit "had capacitors, switches, resistors and even a sawtooth voltage waveform ... wouldn't tell you whether the circuit was or was not infringing." (A10407:4-13; A10399:12-24; A10387:14-18 (circuit having "input signals, local oscillators, switches and resistors" doesn't necessarily (must know infringe); A10461:24-10462:3 the "capacitor value"): A10391:3-4 (need to know "[a]ll of those inputs and outputs"); A10407:4-13; A10527:25-10538:8; A10892:19-10893:21 ("Q. You can't tell anything about whether a circuit or a device does or does not infringe simply by looking at the building blocks that are contained within the device, correct? A. Correct."); A10911:23-10912:17 (to find "energy sampling," "[i]t's not just knowing the values but how those components work together and as well as the nature of the energy transfer signal"); A10975:2-15.)

ParkerVision's expert, Dr. Prucnal, wanted Qualcomm witness testimony to help decipher the Qualcomm schematics, design documents, and code he received during discovery. (A10968:18-10969:15.) Although

Prucnal "ask[ed] for more information" from ParkerVision's attorneys, he "didn't get it." (*Id.*)

Prucnal did not test or simulate Qualcomm's double-balanced mixer architecture. Instead, he simulated *ParkerVision's* architecture and design rules, not Qualcomm's. (A10952:17-25.) His simulations of ParkerVision's patent included differential capacitors that were off by a factor of four and resistors that do not exist in Qualcomm's design. (A10976:3-10; A10966:22-10967:4; A10969:25-10970:3; A10954:9-11.) Although Qualcomm's TX filter would be the focus of ParkerVision's arguments at trial, Prucnal did not perform any analysis to determine the impact of the TX jammer or form any opinion about it. (A11007:4-7; A11031:17-20.) At trial, ParkerVision abandoned Prucnal's computer models and moved to preclude any cross-examination about them. (A10886:24-10887:4; A11042:3-6.)

Contrary to its own infringement theory, ParkerVision presented evidence confirming that the accused Qualcomm receivers use a prior art double-balanced mixer down-converter—not energy in a capacitor—to generate the low-frequency baseband signal. For example, ParkerVision affirmatively introduced the following written statement into evidence:

In the Accused Products, the down-converted signal (e.g., the lower frequency signal, the baseband

signal or the second signal) is formed in the form of current at the output node of the transistors that are part of the continuous mixers. The downconverted signal is not "generat[ed] ... from transferred energy" or by storing the previously "transferred" or "integrated" energy in a storage device

(A5424.)

ParkerVision's expert, Prucnal, unambiguously confirmed that evidence. As Prucnal testified on cross-examination, "the double balanced mix[er] not only is capable of, *it does, in fact, create the baseband.*" (A10988:15-19 (emphasis added).) The evidence further confirmed that the downstream capacitors in the TX filter did exactly what they were supposed to do—filter the TX jammer. (*E.g.*, A7636; *see supra* § III.A.4.) In contrast, no design document, schematic, or testing indicated that the capacitors in the TX filter "generated" the baseband or contradicted the fact that the baseband had already been generated by the double-balanced mixer. (*E.g.*, A11002:18-22; A10988:15-19.)

b. ParkerVision's "Stories About People."

Given the unfavorable technical facts, ParkerVision focused its trial presentation on "stories about people" and its failed effort to entice Qualcomm into a partnership in 1998-1999. (A10139:9-11.) Attempting to bridge the gap between the 1998-1999 discussions and Qualcomm's 2006-

2012 designs, ParkerVision told the jury that, in the eyes of the law, decadeold emails were "circumstantial evidence ... that Qualcomm infringes the patents," and were "just as good" as direct contemporaneous evidence. (A11462:21-11463:5.)

ParkerVision described internal Qualcomm documents as "secret Qualcomm documents" and "secret Emails" that allegedly showed Qualcomm "decided to be untruthful" in 1998-1999, and argued to the jury that "today, these years later, I'd suggest to you they're still doing it." (A10159:4-12; A10160:14-18; A11479:22-25.) ParkerVision's CEO, Jeff Parker, testified that he became "suspicious" of Qualcomm and "didn't really trust Qualcomm" or "believe that Qualcomm was being honest with him." (A12266:10-15.) Parker criticized Qualcomm's manners, complaining that nearly fifteen years earlier, a Qualcomm engineer allegedly failed to shake hands with a ParkerVision engineer. (A10594:15-25.)

ParkerVision omitted the rest of the story. Qualcomm had dismissed ParkerVision's initial overture "thinking it was a sham." (A6789.) Parker returned, "constantly doing this song and dance of trying to sell us [Qualcomm]" on an allegedly new architecture that could perform direct down-conversion. (A6789.) Qualcomm was skeptical, and even Parker wrote

"I think that more than a few of [Qualcomm's engineers] think that we're totally 'full of it.'" (A6769.)

ParkerVision notes that it contacted Jeff Jacobs, the son of Qualcomm's co-founder (BB21³), but omits that Jacobs observed ParkerVision's "credibility problem" with Qualcomm engineers and suggested ParkerVision "let the QUALCOMM engineers perform the tests that are needed"—"If your product does what you claim, then the credibility issues will not linger." (A6769.) Qualcomm asked ParkerVision to "[t]ake your 'selling' hat off." (A6772.)

The parties discussed what a possible deal might look like, assuming the technology turned out to be everything that Parker claimed. Contrary to ParkerVision's brief (BB21), Prashant Kantak, a Qualcomm businessman, did *not* write that ParkerVision had in fact found the holy grail: "While sounding too good to be true, *if indeed true*, it *could be* the holy grail of RF receivers." (A6789 (emphasis added); A6772 ("Of course, all this assumes that your technology can deliver on your early claims.").)

ParkerVision gave Qualcomm a black box to test, but the performance "failed to live up to their claims." (A6789; A10467:23-10468:23; A8489-92

³ "BB" refers to ParkerVision's Principal Brief (blue brief).

(describing tests and results).) After ParkerVision disclosed its technology, Qualcomm realized that ParkerVision's circuit did not solve the difficulties with direct down-conversion for CDMA. (*E.g.*, A6332-38.) Saed Younis—the Qualcomm engineer ParkerVision quotes as declaring that ParkerVision stumbled on a "revolutionary" technology (BB21)—prepared a report that concluded: "ParkerVision's D2D technology offers little novel remedy, if any, to the known problems." (A6338.)

Qualcomm investigated other prior art solutions and concluded that using a double-balanced mixer would give Qualcomm performance "considerably better than what we have seen to date" from ParkerVision. (A6783.) Qualcomm decided that "[w]e can implement direct conversion without their technology." (A6785; A6788; A6196; A6188.) Thus, Qualcomm chose double-balanced mixers and "gave up on" ParkerVision. (A6787; A6312 ("We are NOT using their technique.").4)

ParkerVision's extensive storytelling in a time-limited trial forced Qualcomm to make a choice. Rather than use time calling witnesses to dispute what happened in and around business meetings fourteen years

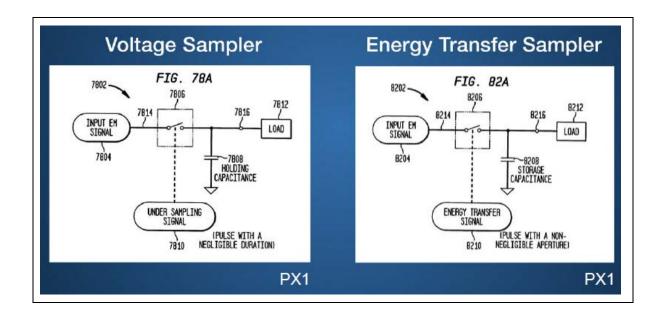
⁴ Contrary to ParkerVision's brief (BB23), Qualcomm never made an offer that would have netted hundreds of millions of dollars—all discussions were conditioned on ParkerVision's technology doing what ParkerVision claimed, and it never did. (A10634:4-10635:19; A10641:14-20.)

earlier, Qualcomm focused on the technical issues relating to the patents and the accused products. Accordingly, after Qualcomm cross-examined ParkerVision's witnesses and obtained the necessary evidence establishing that the double-balanced mixers generate the baseband, the TX filters are just filters, and the products do not practice energy sampling, it moved for JMOL of noninfringement. (A7458-88; A11074:24-11088:17.)

c. Qualcomm's Anticipation Evidence.

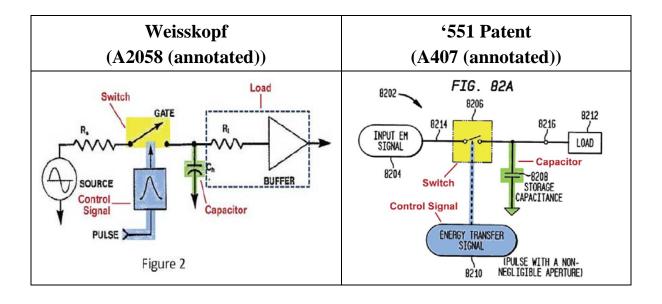
ParkerVision's "energy sampling" invention uses the same architecture as prior art voltage samplers. Lead inventor Sorrells testified that although he did not have an engineering degree, he read about prior art voltage samplers and took a two-week RF course. (A10219:16-10221:1.) He built and tested a prior art voltage sampler that the "literature basically said ... should make a very good receiver." (A10226:11-16.) But he could not make that design work well, so he modified the length of time the switch is closed (the "aperture") and increased the capacitor size until he found a configuration in which the performance "actually went up." (A10226:17-24.)

At trial, he used the following demonstrative showing figures from the patent to compare his energy sampler to a prior art voltage sampler:



(A10380:10-21.) Although the alleged invention and the prior art look the same, ParkerVision coined new terms for the alleged discovery—"energy transfer sampling" or "D2D." (A10153:3-6.)

Neither Sorrells nor the Patent Office found the prior art Weisskopf paper. (A2057-63; A32; A11236:19-22.) Weisskopf included a schematic that closely matches Figure 82A from the patents. It includes the input signal (source), energy transfer signal (pulse), switch (gate), transfer signal (pulse), storage capacitance (C_h), and load (buffer):



Like the patents-in-suit, Weisskopf's design "perform[ed] sampling downconversion to baseband," with the voltage on the capacitor representing the down-converted baseband signal. (A2058 ("charge is imposed on the hold capacitor"); A2059 ("stored voltage Vc"); A11189:5-10 ("The baseband signal is measured as a voltage across the capacitor"); A11146:16-18; A11156:5-11.)

Weisskopf disclosed the features that Sorrells claims to have invented. First, Weisskopf proposed leaving the switch closed for a long period of time. (*See* A2060-61 (Sampling Aperture Width section).) Second, Weisskopf proposed a larger capacitor: "The hold circuit can achieve optimum performance with a *larger capacitor*." (A2059 (emphasis added); A11144:8-11145:7.) Third, although not required by the claims, Weisskopf explained

that stored energy could be discharged, although "Weisskopf's preference is for the charge not to leak away, not to be discharged." (A11147:5-11148:25; A2060.)

At trial, Qualcomm's expert provided an extensive anticipation analysis. (*E.g.*, A11141:8-11199:10; A11240:9-11264:21.) ParkerVision designated three invalidity experts—Prucnal, Sorrells, and Weisskopf himself—but did not call any of them on rebuttal. Instead, ParkerVision told the jury that Weisskopf agreed with ParkerVision (in a report not in evidence), argued that the "generating" limitations required the capacitor to discharge into a low-impedance load, revisited the 1998-99 discussions, and raised irrelevant questions about Dr. Razavi's computer simulations. (A35n.34; A11277:23-11288:16.)

d. ParkerVision's Arguments to the Jury.

In closing, ParkerVision encouraged the jury to speculate that Qualcomm's engineers, if called to testify, would have admitted infringement. (A11520:1-5.) ParkerVision also asserted that Qualcomm's noninfringement expert, Dr. Fox, did not testify because he knew that Qualcomm infringed. (A11471:3-11.) The jury asked to see Fox's report. (A11564:14-16.) Although the report rebutted infringement, the district court could not, and did

not, give it to the jury—the record was closed and all of the expert reports were inadmissible hearsay, excluded by pretrial stipulation.

e. The Infringement Verdict.

The jury deliberated for more than ten hours over three days. (A6.) By mistake, the verdict form listed Qualcomm's Marimba design, a design that had been accused at one time, but which ParkerVision had dropped from the case by the time of trial. (A131; A6n.6.) Though ParkerVision did not put the Marimba design into evidence in any way, the jury checked the infringement box for every product on the list, including the erroneously-included Marimba. (A131.) The Marimba verdict confirmed the effect of ParkerVision's prejudicial storytelling; the jury had no evidence regarding Marimba but nonetheless found Qualcomm liable.

2. Damages/Willfulness Phase.

After the infringement verdict, the court tried damages and willfulness. Before trial, ParkerVision announced to investors that it would demand hundreds of millions of dollars at trial. (A6107.⁵) As an added incentive, ParkerVision's board authorized a bonus for Parker and Sorrells tied directly to the outcome of the case. (A10668:15-10669:18.) Parker told the jury that

⁵ When ParkerVision filed suit against Qualcomm, it was facing delisting by NASDAQ. (A6601.)

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he would have held out for 50% of Qualcomm's receiver profits.

(A11648:22-11649:1.)

But inside the company, ParkerVision's engineers observed that

(A5664.) Even with the patents, ParkerVision never figured out
how to build a viable CDMA cellular receiver. (A10522:16-20.)
ParkerVision's engineers wrote that

(A5664.6) ParkerVision's licensing
efforts also failed; ParkerVision entered into NDAs with

(A5665-70), but no party made a CDMA receiver under license to
ParkerVision at any price.7 (A10522:21-10524:8; A11663:15-19.)

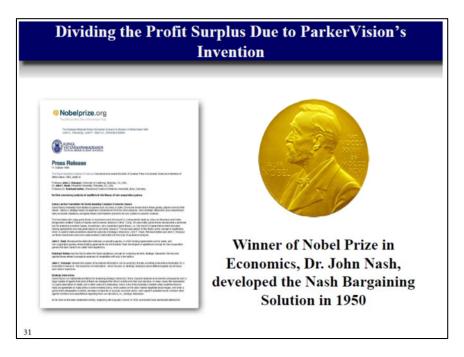
ParkerVision also presented an accounting expert, Paul Benoit. Before trial, Benoit argued that draft Qualcomm spreadsheets from 1998-99 were "admissions" about what the patents would have been worth to Qualcomm in

⁶ ParkerVision built a mouse and an 802.11a Wi-Fi router, but quickly left the Wi-Fi field without turning a profit. (A10336:23-10337:6; A10654:6-10655:5.)

2006-12. The district court excluded Benoit's opinion, finding Benoit's analysis "too speculative and unreliable given radical differences between the hypothetical negotiation and the 1999 negotiations." (A46, A52-53.)

Despite the exclusion order, Benoit *increased* his damage opinion at trial to \$432 million. Benoit argued that nearly all of Qualcomm's receiver earnings were "extra profit," and "just assumed" Qualcomm's customers would have stopped purchasing from Qualcomm without the alleged invention. (A11629:21; A11838:15-19.) He announced that Qualcomm's intellectual property, trade secrets, and know-how were not responsible for *any* profit: "[N]one of those were credited with any allocation." (A11884:7-11.) He concluded that ParkerVision would have received 50% of Qualcomm's "extra" profit, citing the Nash Bargaining Theory and displaying the Nobel Prize medallion:

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(A11756:14-24; A11771:7-11772:8.)

Qualcomm presented three witnesses, including a Qualcomm RF engineer who confirmed what Qualcomm's documents showed and what Prucnal conceded during the first phase—the lower frequency baseband is created by Qualcomm's double-balanced mixer *before* the TX filter, and the TX filter and its capacitors have no effect on the baseband. (A12168-76; A2080.) ParkerVision offered no rebuttal and did not cross-examine the engineer on the subject. Instead, in closing argument, ParkerVision reiterated the 1998-99 story. The jury found no willfulness, but awarded ParkerVision nearly \$173 million. (A134-35.)

C. The District Court's Post-Trial Rulings.

1. Noninfringement: After the verdict, the district court conducted a "careful review of the trial testimony in light of the complex technology at

issue" to determine whether the jury's direct-infringement verdict could stand. (A24.) The district court recognized that the 1998-99 story was not evidence of infringement, and properly focused on the technical evidence. ParkerVision itself introduced written evidence, including Qualcomm's design documents, showing that Qualcomm's mixer, not any capacitor, generates the lower frequency signal. (A2080 ("The mixer downconverts the RF signal to baseband signal. A TX filter is used to block the Tx jammer to a certain degree."); A1505; A1496; A5424.)

As the district court observed, ParkerVision did not contradict that evidence, but rather, confirmed it. Prucnal's "testimony on cross-examination was unequivocal that the double balanced mixers create the baseband *before* the lower frequency signal reaches the capacitors in the TX filter." (A27 (emphasis added).) "Dr. Prucnal further testified that the 'output' of the double balanced mixers in the accused products 'is the baseband." (A27 (emphasis added).) The district court correctly held that "Dr. Prucnal's concessions during cross-examination as well as his direct testimony are fatal to ParkerVision's infringement case." (A28.)

In addition, at the post-trial JMOL hearing, the district court asked ParkerVision whether it had any "evidence in the record that the signal

coming out of the storage capacitor is a lower frequency signal than the signal going in." (A13201:6-8.) ParkerVision could not and did not provide the district court with any such evidence. As the district court observed, Prucnal did not actually test any of the accused Qualcomm products or run computer simulations using Qualcomm's architecture to show that it operated in any other way. (A25 & n.20.) Without any evidence, "Dr. Prucnal's direct and redirect testimony" that the accused products infringe "was notably vague when it came to the generating limitation." (A27.) Accordingly, the district court held that JMOL of noninfringement was "the Court's only choice," and in the alternative, ordered a new trial. (A30-31.8)

2. Invalidity: The district court also considered anticipation. (A32.) Although the court found Qualcomm's arguments "compelling," it did not grant JMOL of anticipation or a new trial, concluding that the jury could have disbelieved Razavi's unrebutted testimony. (A36.) The court also acknowledged that, "[i]n hindsight, and especially given Parkervision's closing arguments," Qualcomm's proposed jury instructions on

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⁸ The district court also agreed that Prucnal's testimony with respect to the sampling limitations for the 50% duty cycle products was "so imprecise and conclusory it cannot establish infringement." (A26n.21.)

disparagement "would likely have been appropriate." (A37.) Nonetheless, the district court denied a new invalidity trial, in part because Qualcomm did not object to counsel's cross-examination questions or interrupt ParkerVision's closing argument. (A37.)

After denying the remaining motions raised by the parties as moot, the district court entered judgment in Qualcomm's favor. (A38; A1.)

IV. SUMMARY OF THE ARGUMENT

A. Noninfringement.

The district court correctly granted JMOL of noninfringement on the "generating" limitations. Each asserted claim requires the down-converter to generate the low-frequency signal from energy stored in the capacitor. The capacitor must receive a non-negligible amount of energy from the high-frequency carrier signal and use that energy to generate the low-frequency baseband signal.

The uncontradicted evidence at trial established that all of the accused products use double-balanced mixers to down-convert and generate the low-frequency signal. ParkerVision's expert conceded those facts. ParkerVision also failed to introduce any testing, computer simulation, or other relevant scientific evidence to support its claims. Instead, ParkerVision expressly

abandoned its expert's pre-trial simulations that had incorrectly modeled *ParkerVision's* circuit, not Qualcomm's. In response to the district court's questions at the JMOL hearing, ParkerVision did not identify any evidence that could support the verdict and, instead, confirmed noninfringement. Thus, as the district court recognized, JMOL of noninfringement was required.

ParkerVision does not provide any basis for overturning the district court's grant of JMOL. Instead, ParkerVision presents several new infringement theories on appeal, none of which are preserved and none of which can change the result. The district court's JMOL (and in the alternative, grant of a new trial) should be affirmed as to all products.

Two additional grounds for affirming the judgment exist. First, as the district court held, Qualcomm's 50% duty cycle products (most of the accused designs) are designed to connect the input to the output at all times, and thus, do not meet the "sampling" limitations. On appeal, ParkerVision argues that the 50% duty cycle products do *not* operate as designed, but failed to present any test data, simulation, testimony, or document to support its theory. The district court was correct.

Second, although the district court did not reach the issue, ParkerVision failed to present substantial evidence of inducement. Qualcomm chose to

follow the prior art double-balanced mixer approach, and correctly believed that ParkerVision's patents did not cover that approach. No evidence suggested that Qualcomm sold the accused products knowing that it infringed or being willfully blind to infringement. That, and Qualcomm's good faith defenses, required JMOL of no inducement.

B. Invalidity.

JMOL of invalidity was also required. ParkerVision argued that, in contrast to the prior art, ParkerVision's energy sampler: (1) took larger samples of the carrier signal (i.e., ParkerVision's switch was closed longer), (2) used larger capacitors, collecting more energy, and (3) allowed the energy to discharge from the capacitor, by ensuring that the downstream circuitry had a low impedance. The prior art disclosed all three features, as Razavi demonstrated in a presentation the district court found "compelling." ParkerVision did not present any rebuttal. Instead, ParkerVision told the jury that Weisskopf believed (in a report not in evidence) the ParkerVision patents were valid because his paper discouraged using the low-impedance embodiment. But teaching away is irrelevant to anticipation, and attorney argument is not evidence. JMOL of invalidity, and in the alternative a new trial, was required.

C. Damages.

Although the judgment should be affirmed without reaching damages, the district court should have conditionally granted Qualcomm's motion for JMOL and a new trial on damages. The \$173 million award grossly exceeded—by an order of magnitude—the maximum amount supported by the record. The massive damages award resulted from ParkerVision's improper use of Nash Bargaining as a 50/50 rule of thumb and its unsupported claim that essentially *all* of Qualcomm's receiver profits from 2006-2012 resulted from ParkerVision's alleged discovery of a new use of an old circuit. *VirnetX*, *LaserDynamics*, *Uniloc*, and *Lucent* entitled Qualcomm to JMOL and/or a new damages trial.

V. ARGUMENT—PARKERVISION'S APPEAL

A. Standard of Review.

Infringement is a question of fact, reviewed for substantial evidence. *Nobelpharma v. Implant Innovations*, 141 F.3d 1059, 1067 (Fed. Cir. 1998). However, "[t]he rule that a jury verdict is reviewed for support by 'substantial evidence' does not mean that the reviewing court must ignore the evidence that does not support the verdict." *Integra Lifesciences v. Merck*, 496 F.3d 1334, 1345 (Fed. Cir. 2007). For example, "an admission made by a

plaintiff's witness can be sufficient to support entry of a JMOL in favor of a defendant." *Nobelpharma*, 141 F.3d at 1065.

This Court reviews the grant of a new trial for abuse of discretion. 800 Adept v. Murex Sec., 539 F.3d 1354, 1368 (Fed. Cir. 2008); Rabun v. Kimberly-Clark, 678 F.2d 1053, 1060 (11th Cir. 1982). Deference is required "[b]ecause of the trial court's 'firsthand experience of the witnesses, their demeanor, and the context of the trial.'" Rabun, 678 F.2d at 1060.

B. ParkerVision's Appeal Relies Solely on Its Expert.

In appealing the judgment, ParkerVision no longer argues that the 1998-99 story is circumstantial evidence that the 2006-12 products infringe. Likewise, ParkerVision makes passing comments about Sorrells' "suspicions" and opinions (BB7; BB23; BB26n.6), but has waived any challenge to the district court's holding that Sorrells' testimony cannot provide substantial evidence of infringement. (A29-30 (district court JMOL order); BB48-62 (not disputing the issue).) *SmithKline Beecham v. Apotex*, 439 F.3d 1312, 1320 (Fed. Cir. 2006). Instead, ParkerVision relies solely on its infringement expert, Prucnal. As set forth below, the district court thoroughly addressed ParkerVision's arguments and properly granted JMOL of noninfringement.

C. The Accused Receivers Do Not Meet the "Generating" Limitations.

1. The District Court Properly Understood and Applied the "Generating" Terms.

Each asserted claim covers a circuit for down-converting a high-frequency radio carrier signal to a low-frequency baseband signal. Specifically, the claims require the receiver to down-convert by "generating" a "lower frequency," "down-converted," or "baseband" signal using energy from the carrier signal stored in the down-converter's capacitors/storage devices. (A493; A702; A930.) At claim construction, the district court agreed with ParkerVision that "generating" should not be construed, and gave the term its ordinary meaning. (A121; A1325-26n.31.)

ParkerVision's witnesses agreed that, to infringe any of the asserted claims, the accused product must: (1) "transfer energy from the carrier signal into the storage device" and (2) "generate the baseband from the energy that was transferred into the storage device." (A10458:2-10.9) If the accused

⁹ **Sorrells**: A10457:6-10 ("energy that's transferred into the storage device is the same energy that is then used to generate the lower frequency signal"); A10458:11-10459:19 (accused products must "generate the baseband signal from" the "storage device"); A10461:3-11 (no infringement "if the accused products down-convert without generating the baseband signal from the energy in the capacitor"); **Prucnal**: A10895:23-10896:10; A10899:1-14 (ParkerVision must "prove that the accused products transfer energy" into the

products create the baseband signal "somehow or somewhere other than from the carrier signal energy that has been stored in the capacitor," they conceded, the accused products do not infringe. (A10460:1-5 (emphasis added); A10458:2-10 (infringement requires "the accused products [to] generate the baseband from the energy that was transferred into the storage device"); see supra § III.A.2 (Figs. 82, 83).)

2. The District Court Properly Held that the Accused Receivers Do Not Meet the "Generating" Limitations. 10

The critical question was whether Qualcomm's products down-convert (generate the low-frequency baseband signal) using a prior-art double-balanced mixer or using energy in the capacitor. ParkerVision introduced written evidence that the mixer (not any capacitor) generates the lower frequency signal (e.g., A2080 ("mixer downconverts"); A5424.), but nonetheless argued that the capacitors in the TX filter performs that function. As the district court observed, to support its theory, ParkerVision should have presented evidence that "the signal coming out of the storage capacitor is a

storage device and that "the accused products generate the baseband signal" from that transferred energy); A10899:21-10900:5; A10902:11-15; A10902:24-10903:3.

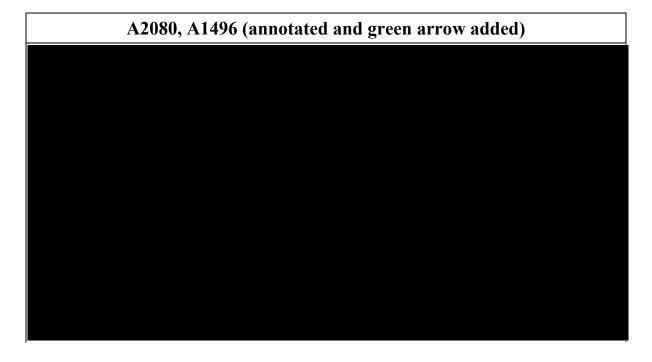
¹⁰ Qualcomm preserved JMOL by moving before the verdict (A7458-88) and renewing its motion following the verdict (A1313-42).

lower frequency signal than the signal going in." (A13201:6-8.) But ParkerVision had no such evidence. Prucnal was "unequivocal" on cross-examination that the double-balanced mixers "create the baseband" before the signal reaches any capacitor. (A27.) As the district court noted, Prucnal conceded that "the 'output' of the double balanced mixers in the accused products 'is the baseband." (A27.)

The district court had it right. Qualcomm's receivers do not use ParkerVision's energy sampling down-conversion architecture or method. Instead, Qualcomm's receivers use conventional double-balanced mixers to "downconvert[] the RF signal to baseband signal." (A2080; see also A8778 ("The mixer down-converts the signal frequency"); A8332; A2314; A6248 ("[T]he mixer output is at baseband."); A6244-45.) This was an old design and not the invention. Prucnal admitted that "double balanced mixers had been making and generating basebands long before ParkerVision ever came up with this invention." (A10988:4-7.) He admitted that the accused products generate the low-frequency baseband signal using double-balanced mixer down-converters. (A11010:15-11011:7.) He conceded that "the double balanced mix[er] not only is capable of, it does, in fact, create the baseband." (A10988:15-19 (emphasis added).)

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Prucnal did not present any fact, test, or simulation contesting that the mixer downconverts. He testified about the block diagram below, which shows several components in the receive path for the Magellan design. (A11010:9-11011:16 (A2080); BB24 (2080).) As the arrows at the right indicate, current flows from the low-noise amplifier (labeled "LNA"), through the double-balanced mixers (denoted by the symbol " \otimes " in the block labeled "Passive Mixer"), downstream to the "Tx Filter" block, and then to additional circuitry:



Looking at this diagram, Prucnal unambiguously testified that "the mixer down-converts the signal to baseband." (A11010:9-11011:7 (emphasis added) (citing A2080).) Discussing the details of the double-balanced mixers,

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Prucnal confirmed that they create the "baseband output." The structure depicted below, from the same Qualcomm design document, shows the details of the double-balanced mixers identified as the Passive Mixer, the \otimes 's in the higher-level diagram above. The outputs BBP and BBM, in red circles, indicate the mixer outputs the down-converted baseband, as Prucnal conceded.

Prucnal (A10788:5-10789:2)	Magellan Design Document (A1505, A2089 (annotated))
Q. Where is the carrier signal? Where is the input?	
A. The input in this case is from the bottom shown by RF in P and RF in M.	
Q. Where is the baseband?A. The baseband output is BBP and BBM at the top of this figure.	

Prucnal walked through a schematic showing the details of the Magellan double-balanced mixer, including its criss-cross design and baseband output. (A10773:17-10774:25 ("Q. How do those outputs relate to the basebands? A. Those are the baseband outputs.") (citing A6992).)

Prucnal also discussed a document showing Qualcomm's Solo design.

He identified the criss-crossing pattern as the "hallmark sign" of a double-

balanced mixer and admitted that the output of the double-balanced mixer "is the baseband." (A10997:15-10998:6 (emphasis added).)

Prucnal (A10997:15-10998:6)	Solo Schematic (A6018)
Q. And you already said those crossing lines are sort of the hallmark or a hallmark sign of the double balanced mixer, correct? A. Yes. Q. And the double balanced mixer has balanced transistor pairs, correct? A. Yes. Q. Those balanced transistor pairs perform an important function, correct? A. Yes. Q. The output of a double balanced mixer is the baseband that we've been talking about, correct? A. Yes.	RFIN_MIXOUT_M

Prucnal's admissions comport with the standard, well-known operation of a double-balanced mixer. Discussing the prior art, Razavi testified that a double-balanced mixer "performs the down-conversion operation." (A11126:1-2 (citing A5557-58, Fig. 1).) He distinguished the claimed energy samplers from double-balanced mixers, explaining that a double-balanced

mixer eliminates the RF (high frequency carrier) and oscillator signals and "generates the lower frequency signal." (A11206:12-20; A11221:5-9; A11244:11-14.)

As the district court held after presiding over the trial and carefully reviewing the record, Prucnal's testimony "was unequivocal that the double balanced mixers create the baseband before the lower frequency signal reaches the capacitors in the TX filter." (A25-27 & n.24.) Prucnal's admissions are dispositive; they require JMOL of noninfringement. *Nobelpharma*, 141 F.3d at 1065.

3. ParkerVision Did Not Introduce Substantial Evidence that the Capacitors in the Downstream TX Filter Generate the Low-Frequency Signal.

At trial and on appeal, ParkerVision incorrectly argued that the capacitor in the TX filter generates the down-converted baseband signal. (A24-30; BB35.¹¹) As detailed below, those capacitors have nothing to do

¹¹ ParkerVision asserts that the "passive mixers" (which ParkerVision does not define) also contain capacitors. (BB24-25.) ParkerVision has not asserted or provided evidence that any capacitors contained in the "passive mixers" play any role in generating the baseband. (BB24-25 (citing A10773-76 (no mention of capacitors); A10799-800 (noting capacitors as "here and here" without reference to mixers); A10804-06 (components downstream of TX filter capacitors).)

with down-conversion. ParkerVision failed to introduce substantial evidence of infringement based on the TX filter for at least three independent reasons.

a. The Low-Frequency Signal Has Already Been Created Before the TX Filter.

First, in the accused Qualcomm products, the double-balanced mixers generate the baseband *before* the current reaches the TX filter. (A10944:1-9; *see also* A8778 ("The mixer down-converts the signal frequency, and the output signal goes to Tx filter for rejecting Tx jammer."); A8332 ("The down-converted current is fed to the Tx Filter"); A2308-09 (after mixer, "[t]he down-converted BB current is *then* fed into following passive pole to get further out-of-band rejection") (Fig. 2-1) (emphasis added).) As the district court correctly observed, although "Prucnal's testimony was contradictory on some points," he "was consistent on the crucial issue that the baseband signal is created in the Qualcomm products *before the storage capacitors* which precludes a finding of infringement." (A27-29 (emphasis added).)

For example, the Magellan schematics show the double-balanced mixers (denoted by the symbol "⊗") receiving RF signals (labeled RF|NP and RF|M) and producing signals BBOP and BBOM, which "are the baseband outputs." (A10773:17-10774:25, A10856:2-20 (both citing A6992); A10760:22-10761:7 ("baseband signal" is "[a]t the output or right-hand side

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of the mixer") (citing A6991).) Because the TX filter is *downstream*, it is irrelevant to the claims:

Prucnal (A10988:15-19 (emphasis added))	Mixer (1) Generates Baseband (2) Before the Capacitors (3) (A6991 (annotated))
Q. So at least in Qualcomm's architecture, the double balanced [mixer] not only is capable of, it does, in fact, create the baseband before it hits the TX filter that you're talking about now, correct? A. Yes.	

ParkerVision attempts to brush Prucnal's admissions aside as nothing more than an "inconsistency" that was the jury's responsibility to resolve. (BB9, BB54.) In support, ParkerVision asserts that "Dr. Prucnal was unequivocal in his opinion that the accused products met each limitation of each asserted claim." (BB9.) But "conclusory testimony" that a product allegedly infringes—whether equivocal or not—is not substantial evidence. *Kim v. ConAgra Foods*, 465 F.3d 1312, 1319-20 (Fed. Cir. 2006).

ParkerVision also cites an answer that the baseband is "created after the capacitor resistor." (BB33.) The "capacitor resistor" language is nonsensical—capacitors and resistors are different things. Moreover, Pruchal

admitted that the baseband current signal already exists as the output of the double-balanced mixer—before the capacitors in the TX filter. (A10947:22-10949:14; A10944:1-9 (baseband created "before the current has reached the capacitor") (emphasis added); A10988:15-19 ("double balanced [mixer] ... create[s] the baseband before it hits the TX filter") (emphasis added).)

Finally, like it did at the district court, ParkerVision ignores *Datascope* and *Nobelpharma*. (A28-30 & n.29 (citing *Johns Hopkins Univ. v. Datascope*, 543 F.3d 1324, 1348-49 (Fed. Cir. 2008); *Nobelpharma*, 141 F.3d at 1065).) Instead, ParkerVision cites three irrelevant cases, arguing that the jury is the sole arbiter of Prucnal's credibility. The noninfringement JMOL here did not present any credibility issue. The testimony "was unequivocal that the double balanced mixers create the baseband before the lower frequency signal reaches the capacitors in the TX filter." (A27; A28-31.)

¹² Embrex v. Serv. Eng'g, 216 F.3d 1343, 1349 (Fed. Cir. 2000) (affirming district court where the parties disputed only the experimental use exception, not whether the acts were infringing); *Presidio Components v. Am. Tech. Ceramics*, 702 F.3d 1351, 1358-59 (Fed. Cir. 2012) (affirming district court where experts from both sides (Dougherty and Ewell) provided "sufficient basis" for verdict and third expert (Huebner) "did not admit without qualification"); *Hewitt v. BF Goodrich*, 732 F.2d 1554, 1558-59 (11th Cir. 1984) (in a personal injury case, deciding how tire was damaged "boil[ed] down to credibility").

b. The TX Filter Does Not Downconvert, It Reduces the TX Jammer.

ParkerVision also failed to introduce substantial evidence for a second reason—the TX filter, including its capacitors, serves a different purpose than down-conversion. (A10993:21-24; A11000:10-13; A11002:18-22.) The TX filter is a low-pass filter, meaning that it allows low-frequency signals to pass by and eliminates high-frequency signals. ParkerVision did not present substantial evidence that the TX filter does anything other than filter.

The low-pass TX filter in the Qualcomm products addresses a CDMA-specific problem that ParkerVision's patents do not address, much less solve. (A12178:9-12179:5; A10985:11-25; A10986:9-16.) CDMA phones simultaneously transmit and receive using the same antenna. As a result, a powerful high-frequency transmit signal leaks back into the receive path as an enormous jammer that can overwhelm the receive signal. (A11023:2-10; A11032:6-9; A11039:12-25 ("16 million times more powerful than any baseband signal" in every accused device).)

¹³ A10917:16-10918:17; A10929:3-15 (low-pass filters "will allow certain frequencies essentially to fly by," while "other frequencies [will] be blocked"). Low-frequency current signals avoid the capacitor and travel along the direct path to the rest of the circuitry. (A10918:18-23, A10919:5-18; A10921:16-19.) High-frequency current signals travel primarily through the capacitor, dropping out of the receive path. (A10919:19-25; A10921:20-23.)

Qualcomm included the low-pass "TX filter" *downstream* of the mixers to attenuate the TX jammer, not for energy sampling or down-converting the received signal. (*E.g.*, A2315 ("A passive RC pole is implemented after the switching core to attenuate out-of-band jammer, especially Tx jammer."); A6018 ("The TX Filter is necessary to filter out the TX signal"); A10998:25-10999:19 (discussing A6018); A7636; A10993:21-24; A11002:18-22; A8778; A8332; A2308-09.)

Using a low-pass filter is not ParkerVision's alleged invention. As Sorrells admitted, putting a low-pass filter downstream of a down-converter was known "over the antiquities of communications theory." (A10447:15-10448:2; A5752.) Prucnal likewise admitted that using the TX filter for its intended purpose—low-pass filtering to remove the TX jammer—does not infringe. (A10990:11-18.)

On appeal, ParkerVision argues that its "expert testified that the capacitors were essential to generating the baseband signal and that, without them, the baseband signal would not be generated as required by the claims." (BB2.) To the contrary, Pruchal agreed at trial that without the TX jammer, Qualcomm would not have needed the TX filter or its capacitors. (A11019:11-17 (A2080).) Qualcomm makes many non-CDMA

downconverters that do *not* have the TX filter because, absent simultaneous transmit and receive, there is no jammer problem. (A6998-99.) ParkerVision *dropped* its claims against those devices. (A5405.)

As Prucnal admitted and the design documents show, the capacitors in Qualcomm's TX filter are designed not to receive *any* current or energy from the already downconverted baseband signal. (A10993:21-24; A10998:25-10999:19; A11002:18-22.) The TX filter is simply a filter, allowing the desired low frequency signal to pass while the undesired jammer is partially blocked.

c. ParkerVision Introduced No Tests, Simulations, or Other Scientific Evidence in Support of Its Infringement Theory.

ParkerVision failed to provide substantial evidence that capacitors in the TX filter generate the low-frequency baseband signal for a third reason—the record contains no evidence that the capacitors in the TX filter collect the requisite "non-negligible" energy from the weak carrier signal.

The claims require "non-negligible" amounts of energy from the carrier signal to be transferred to the capacitor, *i.e.*, "amounts that are distinguishable from noise." (A94.) In other words, to prove its infringement theory against Qualcomm's current-mode products, ParkerVision needed to show that non-negligible carrier current enters the capacitor. As Sorrells testified: "If there's

no current, there's no infringement." (A10454:2-10 (emphasis added).) Prucnal admitted that an "overwhelming amount" of current from the jamming transmit signal (not the carrier or the baseband) goes into the accused capacitors. (A11032:25-11033:3.)¹⁴ Nonetheless, ParkerVision speculates that *some* energy from the carrier signal *might* also leak into the TX filter capacitors. But ParkerVision introduced no testing, computer simulations, or other substantial evidence to substantiate that speculation. (A28-30; A11007:4-7; A11031:17-20.) To the contrary, after discussing the Magellan design document shown above (A2080/A1496), Prucnal conceded that the figure provided "no way ... to calculate how much, *if any*, of the baseband current is going into and out of the capacitor." (A11031:10-20 (emphasis added); A11032:19-24.)¹⁵

As a result, this Court's decision in *Becton, Dickinson & Co. v. Tyco Healthcare*, 616 F.3d 1249 (Fed. Cir. 2010), forecloses any finding of infringement here. In *Becton*, the patent required energy (1) to be stored in a

¹⁴ Attempting to avoid invalidity, ParkerVision argued that the presence of a large signal can prevent a capacitor from performing the generating function. (A5065.)

¹⁵ Seeking to avoid invalidity, ParkerVision argued that the claims require the transferred energy to be substantial *and* in an amount distinguishable from noise, such that "knowing whether or not substantial energy is transferred into any storage device, assuming that's true, that's only half the battle." (A13132.)

hinge (54, depicted below in blue) and (2) then used to move a needle guard (40, in green) to cover the end of the needle (18, in red):

Retracted Hinge Stores Energy (U.S. Patent No. 5,348,544, Fig. 2)	Releasing Energy Moves Guard (Id., Fig. 4)
18 14 40 42 47 56 58 54 22 44 47 72 36 36 30 30 30 30 30 30 30 30 30 30 30 30 30	51 58 54 56 66 62 50 52 18 86 14 69 70 20

Regardless of how the schematics of the invention and the accused products appeared on paper, this Court required the patent owner to "provide ... test data or even a single live demonstration" to show the accused devices "stored energy" as required by the claims. *Id.* at 1257. Despite "ample opportunity," the patent owner failed to prove that the accused hinges contained stored energy. *Id.* at 1258-59, 1265.

So too here. Expressly following *Becton*, the district court correctly found that ParkerVision had provided no test/simulation to establish its infringement theory that the capacitors in the TX filter contained non-negligible amounts of stored carrier energy, much less that they used that energy to generate the baseband. (A28-30.)

ParkerVision did not address *Becton* at the district court or in its principal brief in this Court. (A28-30 & n.29.) ParkerVision contends that it was not required to introduce testing evidence, but the cases it cites are distinguishable. Indeed, if testing was required for a simple mechanical device like the one at issue in *Becton*, it must be necessary for the complex electronics at issue here—particularly when the TX filter is designed to serve a different purpose, and ParkerVision's expert admitted facts establishing noninfringement. (*See supra* §§ V.C.2, V.C.3.b.)

Unable to distinguish *Becton*, ParkerVision contends that "it was perfectly appropriate for Dr. Prucnal to base his testimony on [1] Qualcomm's circuit schematics and technical documents, [2] well-known electrical engineering principles concerning how switches and capacitors

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¹⁶ Forest Labs v. Abbott Labs. supports the judgment, because this Court affirmed JMOL of noninfringement where the patentee's expert, like Prucnal, "never measured" or tested the accused product but instead "assumed" the claimed element to be present. 239 F.3d 1305, 1309-10, 1312-13 (Fed. Cir. 2001). Martek Biosciences v. Nutrinovas is irrelevant, because the expert in Martek "testified that he had calculated the critical values." 579 F.3d 1363, 1373-74 (Fed. Cir. 2009). Here, Prucnal disavowed his computer simulations and did not test or calculate anything. (A11031:17-20.) Finally, Lucent Techs. v. Gateway holds that Microsoft's instructions were sufficient evidence to prove that at least one customer somewhere in the world used the accused date-picker feature. 580 F.3d 1301, 1318 (Fed. Cir. 2009). Here, in stark contrast, the Qualcomm design documents make clear that Qualcomm's double-balanced mixers generate the baseband.

work, and [3] computer simulations." (BB50.) But here Qualcomm's "technical documents" demonstrate non-infringement because they show that double-balanced mixers generate the baseband. (*E.g.*, A10944:1-9 (2080); *see supra* § V.C.2.) And ParkerVision repeatedly conceded that schematics were *not* sufficient to tell "whether the circuit was or was not infringing" in this case. (*E.g.*, A10407:4-13; *see supra* § III.B.1.a.) If schematics were by themselves sufficient, then ParkerVision's claims would unquestionably be anticipated by prior art voltage samplers which, as even ParkerVision concedes, look identical to ParkerVision's purported invention.

Nor do "well-known electrical engineering principles" show infringement. Prucnal acknowledged the well-known principles that double-balanced mixers down-convert and low-frequency current signals pass by low-pass filters. (*E.g.*, A11010:15-11011:7; A10988:15-19; A10917:16-10918:17; A10918:18-23; A10919:5-18.)

Finally, ParkerVision erroneously states that Prucnal based "his testimony on ... computer simulation[s]." (BB50.) As detailed above (*see supra* § III.B.1.a), ParkerVision sought to *exclude* Prucnal's irrelevant simulations¹⁷ and argued that Prucnal "*did not* rely on computer simulations to show infringement." (A5154n.15 (emphasis added).)

¹⁷ A10886:24-10887:4, A11042:3-6.

4. ParkerVision's New Arguments Are Waived and Unsupported.

ParkerVision mistakenly argues that the district court "was confused" and contends that the district court incorrectly "criticized ParkerVision for allegedly raising a 'new infringement theory' at the JMOL hearing in which 'more than one 'baseband signal ...' might be created in the Qualcomm products." (BB43-44, BB55.)

At the JMOL hearing, the district court put the dispositive question directly to ParkerVision, asking "why Dr. Prucnal's concession that the [baseband] was created prior to the storage capacitor is not the end of the case." (A13192:20-13193:1.) In response to that question, ParkerVision raised a new multiple-baseband argument: "Nothing in the claim construction or the structure of the claims prevents having multiple signals that meet the broad definition ... of baseband signal and lower frequency signal." (A13194:6-9; A13201:25-13202:5 ("THE COURT: ... I'm trying to understand your argument which is, if I'm appreciating it correctly, it's that the signal coming out of the capacitor is not the same signal as the one that went in it. MR. BUDWIN: Correct.").)

During the hearing, the district court gave ParkerVision an opportunity to substantiate the new theory, asking: "Where is the evidence in the record

that the signal coming out of the storage capacitor is a lower frequency signal than the signal going in?" (A13201:6-8; A13201:20-22; A13202:11-15.) ParkerVision failed to cite any evidence in support of the new theory. Instead, ParkerVision essentially conceded noninfringement, agreeing that the lower-frequency signal appears at the output of the double-balanced mixer switches: "This here is the switch output.... The output is ... of a lower frequency than what went in." (A13204:8-11; A13203:4-9 ("[O]nly a portion of the energy from the incoming signal is going to be visible at the output of the switches [T]he output is a lower frequency signal."); see also A13216:19-219:3.) The district court properly rejected ParkerVision's attempt to argue a "new infringement theory" and noted its skepticism with ParkerVision's shifting theories. (A27-28.)

ParkerVision abandons the multiple-baseband theory, and improperly attempts to raise three new infringement theories. A party "cannot simply choose to make its arguments in iterative fashion, raising a new one on appeal after losing on its other at the district court." *Golden Bridge Tech. v. Nokia*, 527 F.3d 1318, 1323 (Fed. Cir. 2008); *Fresenius USA v. Baxter Int'l*, 582 F.3d 1288, 1296 (Fed. Cir. 2009) ("If a party fails to raise an argument before

the trial court, or presents only a skeletal or undeveloped argument to the trial court, we may deem that argument waived on appeal.").

a. ParkerVision's New "One and the Same Point" Theory.

On appeal, ParkerVision for the first time disputes the use of the terms "upstream" and "downstream," contending that the terminology caused "substantial confusion." (BB18n.4.)¹⁸ ParkerVision argues that "it makes no sense to try to isolate a specific point along a wire drawn in a schematic because all the points along the wire 'are one and the same point.'" (BB53; BB3; BB34-35 (addressing voltages).) According to ParkerVision, the district court erroneously based its decision on the fact that "a baseband signal was present on a part of a wire located 'before' the capacitors." (BB42.) That was error, ParkerVision contends, because "the same baseband signal will appear at every point along a wire." (BB45.)

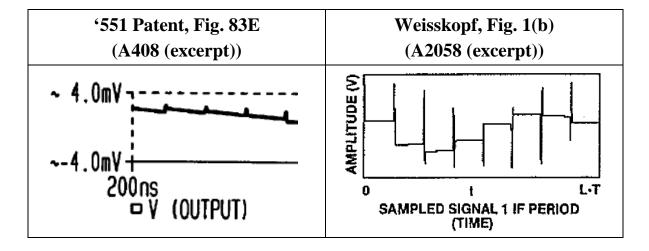
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ParkerVision recognized in the trial court that the accused products use current signals (not voltage signals) and embraced the upstream/downstream distinction. (*E.g.*, A5150 (ParkerVision JMOL opposition: "downstream of the capacitors"); A10845:7-12 (ParkerVision direct examination: ("downstream capacitor"); A11339:2-7 (ParkerVision cross-examination: ("additional circuitry down-streamed [sic]").) ParkerVision also now argues that the district court was confused by Qualcomm's schematics, and erroneously viewed them as "a literal reproduction of the circuit's layout." (BB34.) ParkerVision never offered any other reading of Qualcomm's schematics, and any such new argument is waived.

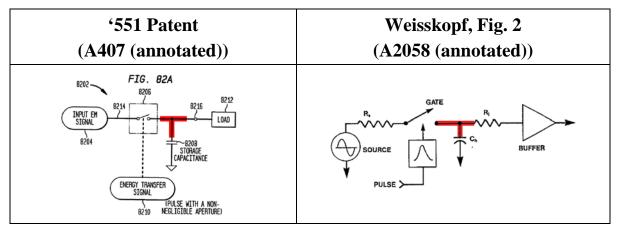
ParkerVision never argued that theory below and cannot raise it now. Golden Bridge Tech., 527 F.3d at 1323. To the contrary, Prucnal conceded that the accused devices generate the baseband "before the current has reached the capacitor." (A10944:1-9 (emphasis added); A10988:15-19 (accused products "create the baseband before it hits the TX filter.") (emphasis added).) Even after the trial, ParkerVision did not raise its new theory. Trying to distinguish prior art, ParkerVision argued that, if a down-converter generates the low-frequency signal before the capacitors, it does not practice the claimed energy sampling. (A5068 ("first and second signals are observed immediately after the switches ... and before any impedance devices") (emphasis in original).)

ParkerVision and its witnesses did not dispute the district court's understanding of the relevant electrical engineering principles, and for good reason; the district court got it right. ParkerVision's appeal brief (not the district court) strays because it ignores the record and confuses *voltage* and *current*. ParkerVision's patent and the Weisskopf prior art use *voltages* to represent signals. As shown by the units of voltage ("mV" and "V") below, the capacitors in ParkerVision's patent generate the baseband signal as a

voltage across the capacitor over time, ¹⁹ like the Weisskopf prior art. ²⁰



As Razavi testified, the *voltage* in Weisskopf's design is the same along the line indicated below in red, and the same is true of ParkerVision's energy sampling patent.



(A11189:5-10 ("The baseband signal is measured as a voltage across the

¹⁹ The circuit in ParkerVision's patent receives a high-frequency voltage signal—"V (VOLTAGE-SRC)" in Fig. 83A—and generates a low-frequency voltage signal—"V (OUTPUT)" in Fig. 83E. (A408.)

²⁰ In a system that uses a capacitor to sample a voltage signal, the "output voltage ... tracks the input voltage" while the switch is on. (A6322.)

capacitor"); A11146:16-18; A11156:5-11; A11320:8-12.)

ParkerVision's new "one and the same point" theory would *not* apply to the accused Qualcomm products, which generate the baseband as a *current* signal, not a *voltage* signal.²¹ (*E.g.*, A6997; A2308 ("The incoming RF signals are converted into current ... The downconverted BB current"); A6017 ("The mixer is a passive double balanced current driven type."); A8081 ("From a high-level system view, each Rx FE [receive front-end] path provides a voltage-to-current conversion"); A8082 ("V-to-I" (voltage to current) conversion step); A1496 (In_band Gain (baseband) measured in micro-Amps, the unit of current).²²) Each of the designs accused at trial were

²¹ In "current mode," "the signal input to the mixer is represented by varying the amount of electrical current input into the mixer." (A5631.) In "voltage mode," "the signal input to the mixer is represented by varying the voltage input into the mixer." (A5631.) Qualcomm highlighted the distinction between current-mode and voltage-mode, but ParkerVision chose not to raise its new "one-and-the-same-point" argument. (A5104; A13219-20.)

²² See also A8171 ("The differential RF voltage signal is converted into a differential RF current signal via LNA The RF current signal at the LNA output is down-converted by a passive mixer core The output BB [baseband] current signal is applied to Tx LPF (passive RC filter) to remove strong out-of-band Jammers."); A8332 ("The LNAs ... feed[] in the amplified RF current to the 25% duty cycle passive mixer. The down-converted current is fed to the Tx Filter, which rejects the Tx jammer signal and helps achieve the linearity specifications.").

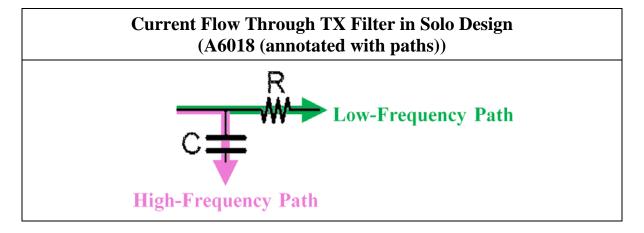
current-mode products; ParkerVision withdrew its infringement allegations against Qualcomm's voltage-mode products before trial.²³

The distinction is critical because, as the district court understood, a line is *not* "one and the same point" for determining the amount of current present along it. Rather, as the district court correctly understood and ParkerVision conceded until appeal, current flows like water. (A11014:17-24.) According to the well-known principle called Kirchhoff's current law, the lines to the left and right of a node are *not* a single point; current flows *downstream* and when it reaches a fork, it must take one of the two paths such that "the *sum* of the currents going into a node is equal to the *sum* of the currents going out of the node." (A11014:17-24 (emphasis added).)

Because Qualcomm's TX filter is a low-pass filter, it diverts the different current signals in different directions. The TX jammer current flows *through* the TX capacitors, while the low-frequency baseband current signal stays on the line above and flows *by* them. (A10917:16-10918:17; A10929:3-15 (filters "allow certain frequencies essentially to fly by," while "other frequencies [will] be blocked"); A10918:18-23, A10919:5-18, A10921:16-19 (low-frequency signals pass by capacitors in a low-pass filter); A10919:19-

²³ A5631-33 (listing current or voltage mode); A5405 (dropping voltage-mode products); A5650-51 (products at trial).

25, A10921:20-23 (high-frequency signals travel through capacitors in a low-pass filter); *see also* A12168-76 (products designed to let the baseband pass).)



Thus, the district court was not "confused" at all. The problem lies, instead, with ParkerVision's new argument on appeal.

b. ParkerVision's New "Distortion" Theory.

On appeal, ParkerVision also argues that, "even reading the schematic literally," the downstream capacitors draw so much energy that they necessarily "distort" the carrier signal and thus influence the baseband signal. (BB53.) ParkerVision never argued that the claims require "distortion." During the *Markman* briefing, ParkerVision successfully made the *opposite* argument, contending that "it does not follow that the disclosed invention—because it involves the transfer of non-negligible amounts of energy—requires that transfer 'cause substantial distortion of the carrier signal." (A5177; A91-94) The new argument is another about-face and is waived.

Even if distortion and influence were relevant, ParkerVision cites no evidence that the capacitors in Qualcomm's TX filters distort the carrier signal and influence the low-frequency baseband. ParkerVision instead refers to a figure in the ParkerVision patent, arguing that the figure shows "how the circuit actually works." (BB53.) ParkerVision is referring only to *the ParkerVision patent*, not the accused circuitry in Qualcomm's products. ParkerVision's patent does not mention a double-balanced mixer, much less explain Qualcomm's current-mode products. (A10396:9-12; A10952:17-22.) This new argument is not substantial evidence of infringement. *Becton*, 616 F.3d at 1257-60; *Homeland Housewares v. Sorensen R&D Trust*, 2014 WL 4398312, at *6 (Fed. Cir. Sept. 8, 2014) (statement in the patent-in-suit "says nothing about how plastic flows in the accused molds").

ParkerVision never offered any simulation or test results supporting its new "distortion" theory because that theory does not apply to Qualcomm's current-mode receivers.²⁴ On appeal, ParkerVision offers attorney argument in footnotes, comparing Qualcomm's receivers to an older home. (BB18; BB34n.8.) That is no substitute for record evidence, and has no bearing on the accused products. "Unsupported attorney argument, presented for the first

²⁴ See A12168:14-25 (Tx filter designed to "have no effect on the baseband").

time on appeal, is an inadequate substitute for record evidence." *Becton*, 616 F.3d at 1260; *Gemtron v. Saint-Gobain*, 572 F.3d 1371, 1380 (Fed. Cir. 2009). JMOL of noninfringement was correct.

c. ParkerVision's New "Generated More than Once" Theory.

Finally, ParkerVision argues one more theory on appeal that it did not raise below—that a baseband signal can be "generated more than once," and that "the fleeting and transitory nature of a baseband signal" means that circuitry must "continue[] to generate ... versions of the same baseband signal as it propagates th[r]ough the phone." (BB55-56.)

ParkerVision did not present its new theory to the district court and may not do so now. The claims recite an apparatus for down-converting a signal, and as the district court observed, the "generating" limitations refer to down-converting the high-frequency signal to a low-frequency signal. (A13201:6-8 (asking for "evidence in the record that the signal coming out of the storage capacitor is a lower frequency signal than the signal going in").) ParkerVision never challenged that correct understanding of the claims. Nothing in the ParkerVision patents suggests that the limitations requiring generating a lower-frequency signal do not require down-conversion, but instead are satisfied merely by passing an already down-converted low-

frequency signal from one circuit block to the next. ParkerVision's new theory would have opened ParkerVision's patents to a host of additional prior art, because, as Sorrells admitted, down-converters have been followed by low-pass filters and other circuit blocks since "the antiquities." (A10447:15-10448:2; A5752.) *Digital-Vending Services v. Univ. of Phoenix*, 672 F.3d 1270, 1273-74 (Fed. Cir. 2012) ("[A] party may not introduce new claim construction arguments on appeal").

ParkerVision's new theory also lacks record support. ParkerVision did not present any evidence that any capacitors in the TX filter create additional versions of the baseband current signal by storing samples of the current signal. To the contrary, the capacitors are specifically designed so that the low-frequency baseband signal will *pass* by the capacitor. (*See supra* §§ V.C.3.b, V.C.4.a; *see also* A12168-76.)

Accordingly, each of ParkerVision's new "generating" theories is waived, contradicts the proper claim scope, and lacks substantial evidence in the record. The district court's judgment should be affirmed.

- D. None of the Accused 50% Duty Cycle Products Satisfy the "Sampling" Limitations.
 - 1. The 50% Duty Cycle Products Always Have a Connection from the Input to the Output.

Although the "generating" limitations are sufficient to affirm the judgment of noninfringement as to all products, the district court also granted JMOL that the majority of the designs (the 50% duty cycle products²⁵) do not meet the "sampling" limitations. (A25-26 & n.21.)

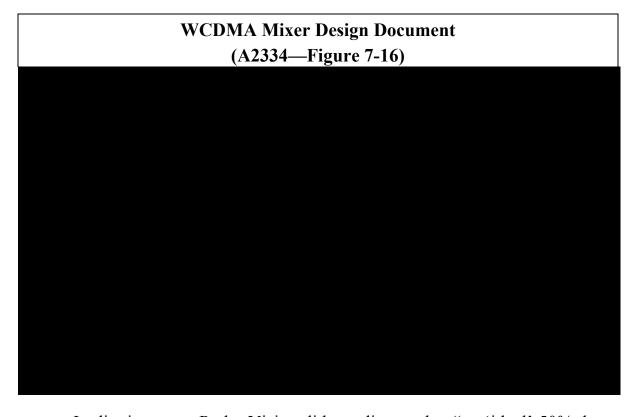
At trial, the parties agreed that all asserted claims have a sampling limitation, which the district court construed as "reducing a continuous-time signal to a discrete-time signal." (A87.) As ParkerVision argued in trying to distinguish the prior art, the sampling limitations are *not* met if "there's always a connection from the input to the output of the device." (A10269:12-10270:1; A10412:21-10413:23.)

The 50% duty cycle products are designed such that each pair of transistors is on for at least 50% of the time. On appeal, ParkerVision neglects that Qualcomm's double-balanced mixers each have *two* pairs of balanced transistors, which are part of the criss-cross design that is the

²⁵ The 50% duty cycle products include Astra, Bahama, Eagleray, GZIF4, Hercules, Iris, Libra/Gemini, Merlin, Ramsis, Volans, Voltron, and Ywing. (A7001; A5650-51.)

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hallmark of a double-balanced mixer.²⁶ The transistor pairs take turns being in the on state, such that a connection between the input and output is maintained 100% of the time for both the I and Q paths. Figure 7-16 below shows the signals that control the transistors. (A2334.) At least one of the transistor pairs is "on" (*i.e.*, above zero) for both the I path (rectangles below) and Q path (triangles) at all times, with overlapping periods when both the I or Q transistor pairs are on.



In district court, ParkerVision did not dispute that "an 'ideal' 50% duty cycle product" would have a connection between the input and output at all

²⁶ Hence the "double" in double-balanced.

not necessarily ideal." (A13.) This was wishful thinking. At trial, ParkerVision did not offer any test, simulation, or even any clear testimony that Qualcomm's products do not operate as designed—much less that this alleged "non-ideal" performance was intentional, which would be required for inducement.

On appeal, ParkerVision argues that "Dr. Prucnal testified that all of the accused products operate at duty cycles lower than 50%." (BB47.) But Prucnal did not say that. Despite the 50% duty-cycle products being the majority of accused designs, ParkerVision points to just 16 seconds of trial testimony:

- Q. Now based on your review of the schematics and the design documents in this case, do any of the accused products have a duty cycle that's always at 50 percent?
- A. No.
- Q. Can the duty cycles vary to less than 50 percent?
- A. Yes.

(A10876:23-10877:3 (noting times).)

The district court correctly held that this testimony is "so imprecise and conclusory" it cannot support an infringement verdict. (A25-26 & n.21.)

Prucnal stated that the duty cycles of the accused products are not "always" 50%, but did not say whether they were higher, which could not infringe under any theory, as opposed to lower. Moreover, Prucnal indicated that duty cycles for some of the accused products "can" vary to less than 50%, but the 25% duty cycle products have that characteristic. Prucnal's vague and conclusory testimony could not meet ParkerVision's burden for direct infringement. *Becton*, 616 F.3d at 1257-59; *Kim*, 465 F.3d at 1319-20. (A25-26 & n.21.) Nor could his testimony provide substantial evidence to support any inducement or damages verdict.

2. ParkerVision's Counterarguments are Unavailing.

In the wake of the district court's JMOL order, ParkerVision offers a slew of arguments but none can support an infringement verdict. First, ParkerVision attempts to reargue claim construction, suggesting that a switch is always sufficient to meet the "sampling" limitations. (BB57-58.) ParkerVision's appeal argument conflicts with its trial arguments, which recognized that the presence of a switch is not enough to establish "sampling." (A5063 (arguing that Weisskopf does not have a "means for sampling" despite having a switch); A5066 (arguing that Estabrook does not sample even though it has a switch); A10436:4-16 (arguing that prior art

Figure 5-10 (A5589) has "a continuous output" and thus is "not a discontinuous output made up of discrete samples").)

Second, ParkerVision mistakenly contends that the district court must have relied on evidence outside of the trial record in granting JMOL. (BB58.) The uncontradicted evidence, such as Figure 7-16, showed that Qualcomm's 50% duty cycle products are designed to connect the input to the output through both the I and Q paths at all times. (*E.g.*, A2334 (Fig. 7-16); A1336.)

Third, ParkerVision attempts to blame Qualcomm, arguing that "Qualcomm never cross-examined Dr. Prucnal regarding the 50% duty cycle products." (BB29.) ParkerVision bore the burden of showing that Qualcomm's products do not operate as designed, not Qualcomm. Furthermore, Qualcomm performed a vigorous cross-examination of Prucnal on the importance of analyzing the specific circuit values and his failure to perform computer simulations or tests on Qualcomm's actual designs. Qualcomm did more than required.

Fourth, ParkerVision argues that Prucnal's vague statements referred specifically to the 50% duty-cycle products, because they allegedly "occurred during his discussion of the 50% duty cycle products." (BB41n.10.) To the

contrary, the leading questions at-issue asked Prucnal about "any of the accused products," not the 50% duty-cycle products. (A10876:23-10877:3.)

Fifth, ParkerVision belatedly argues that '342 claim 18 does *not* require sampling. (BB20.) ParkerVision took the *opposite* position in the district court, contending that DeMaw did not anticipate '342 claim 18 because it "does not teach sampling." (A5068.)

Sixth, ParkerVision argues that the Magellan 25% duty-cycle product was representative of the 50% duty-cycle products. (BB58.) Although the district court upheld ParkerVision's use of the Magellan 25% duty-cycle design as representative for other 25% duty-cycle products, it properly held that ParkerVision did not present substantial evidence for the much different 50% duty-cycle products. (A25-26 & n.21.)

Finally, ParkerVision argues that two Qualcomm documents show that its 50% duty-cycle products actually have duty cycles as low as 30%. (BB29 (citing A1400 and A1461).) These documents were not cited to the district court and are irrelevant in any event. They refer to the "external clock source" provided to the device, not the duty cycle for the internally-generated local oscillator and mixer. (A1461; A1400 ("system reference clock").) As customer-facing "procurement" documents, they do not describe the internal

circuit functions. (A1360; A1429.) Moreover, the Qualcomm design documents that do describe the control signals for those circuits show that there is always a signal for both the I and Q paths. (*See, e.g.*, A6019-20 (comparing "normal" 50% duty-cycle design against the "[n]ew 25% ... duty cycle scheme" and showing, for example, that "I Channel Performance with Time" always has a "Signal" for the 50% duty-cycle design but changes between "Signal" and "No Signal" over time for the 25% duty-cycle design); *see also* A5429 ("In the Accused Products with a 50% duty cycle, each LO signal pulse is one-half of the period of the RF carrier signal.").)

In sum, ParkerVision has failed to identify any error in the district court's noninfringement JMOL for the 50% duty-cycle products.

E. The Judgment May Be Affirmed on the Alternate Ground of No Inducement.²⁷

Because Qualcomm sold nearly all of the accused chips overseas to foreign manufacturers, this was an inducement case.²⁸ To prove inducement, ParkerVision bore a difficult burden of showing Qualcomm knew that it infringed or was willfully blind to infringement. *Global-Tech Appliances v. SEB*, 131 S. Ct. 2060, 2068-72 (2011).

²⁷ The district court did not reach Qualcomm's JMOL for no inducement.

²⁸ More than 99.5% of ParkerVision's asserted damages arose from its inducement claim. (A134.)

No reasonable jury could have found inducement. Qualcomm could not have been willfully blind to a high probability of infringement where it adopted a noninfringing prior art approach. Qualcomm's technical design documents uniformly describe its use of the well-known double-balanced mixer down-converter, not a sampler. As Qualcomm wrote in 2000, when it selected the double-balanced mixer for its "ZIF" direct down-converter—a precursor to the accused devices—the "chosen mixer topology is a relatively standard one, which is commonly used in [prior art] designs." (A6248.)

Qualcomm ZIF Design 2000	Lee Textbook
(A6245)	(A6139—Fig. 12.10)
ON IX ON IS	$IF Out$ V_{LO} $I_{DC} + I_{RF} cos \omega_{RF} t$ $I_{DC} - I_{RF} cos \omega_{RF} t$

The same double-balanced mixer architecture carried forward to the accused products, with the designers of the accused products continuing to recognize that Qualcomm had "chosen to adopt conventional double balanced passive mixer." (A2089.) ParkerVision's own expert recognized that the

conventional path was well-worn: "[D]ouble balanced mixers had been making and generating basebands long before ParkerVision ever came up with this invention." (A10988:4-7.)

The district court's JMOL decision further highlights the lack of any culpable mental state. The district court expressly held that no reasonable juror could have found that Qualcomm's products infringed, and also found Qualcomm's unrebutted evidence of invalidity "compelling." (A28-30, A36.) Those findings regarding noninfringement and invalidity each provide independent grounds for vacating any inducement verdict. *Commil USA v. Cisco Systems*, 720 F.3d 1361, 1367-69 (Fed. Cir. 2013). Where the infringement defenses persuaded the district court—because it is objectively reasonable to believe there is no infringement—knowledge of infringement, willful blindness to it, and recklessness are absent as a matter of law. *Cf. Safeco Ins. v. Burr*, 551 U.S. 47, 70 & n.20 (2007).

Finally, ParkerVision offered no evidence that anyone from Qualcomm believed that the accused products practiced ParkerVision's patents. Instead, ParkerVision focused on emails from the 1998-99 discussions, and an email from Dr. Wheatley that states: "I think it is going to be very difficult for anybody to ever use *this technique* without stepping on one or more of their

claims." (BB22 (emphasis added).) But Wheatley explained that Qualcomm was "NOT using their technique."²⁹ (A6312 (emphasis added).)

The evidence confirmed that Qualcomm knew it was taking an entirely different direction from energy sampling. (*E.g.*, A6783 ("using a double balanced mixer" would give Qualcomm performance "considerably better than what we have seen to date" from ParkerVision—"We do not need Parkervision IPR to proceed"); A6787 ("[W]e gave up on them."); A5648 ("[W]e told them to go away"); A7004 (ParkerVision has "a checkered history with their products and technology and we had not found their technology to be viable."); A7006 (ParkerVision's claims were "never substantiated with any believable data," and "it didn't seem they even understood RF, but they were always anxious to jump into business discussions"); A6788 ("We have looked at them and they have nothing of value.").³⁰) The district court incorrectly excluded A7004-05 and A7006-11

²

²⁹ ParkerVision does not mention the 2004 email it cited in the district court—which stated that Qualcomm should study all potential down-conversion approaches and that "no idea is too stupid." (*See* A1340-41 (discussing email).) Because Qualcomm indisputably chose to use double-balanced mixers, that email is not substantial evidence of anything.

³⁰ ParkerVision argues that Qualcomm decided "to toe the deliberately misleading 'party line,'" saying one thing internally and telling ParkerVision something else. (BB6.) As these internal Qualcomm emails demonstrate, Qualcomm's *internal* statements matched its *external* statements—Qualcomm

during trial on hearsay grounds. (A11385:6-11386:25.) But Qualcomm offered the emails for a non-hearsay purpose—the state of mind of Qualcomm employees at the time the emails were written. Fed. R. Evid. 801(c)(2). With or without the excluded emails, the record lacks substantial evidence of inducement and the judgment of noninfringement may be affirmed on that ground as well.

F. The District Court's Alternative New Trial Order Was Correct.

In the alternative, the district court properly granted Qualcomm's motion for a new trial on infringement. (A38.) The district court acted well within its discretion, particularly given how ParkerVision tried its case. *Moxness Prods. v. Xomed*, 891 F.2d 890, 893 (Fed. Cir. 1989) ("[T]he district court has wide discretion and may consider the credibility of witnesses and weigh evidence.").

ParkerVision argues that the district court suffered from a "misunderstanding of the patents and the technology" and "simply misunderstood the significance of the evidence." (BB61.) But as noted above, the district court got it right. It gave ParkerVision every opportunity to

gave up on ParkerVision and energy sampling. (A8489-92 (describing tests and results).)

identify evidence in the record to support a verdict, and ParkerVision failed. (A13192-93; A13201:6-8; A13201:20-22.) ParkerVision did not raise the theories that it argues on appeal, and the district court could not have "misunderstood" theories not properly before it.

ParkerVision urges this Court to find an abuse of discretion because Qualcomm did not present its own noninfringement expert. (BB61.) But ParkerVision has it backwards. A defendant has "no obligation to rebut" if a plaintiff fails to present sufficient evidence. *ResQNet.com v. Lansa*, 594 F.3d 860, 872 (Fed. Cir. 2010). ParkerVision's expert *conceded* the facts establishing noninfringement. (A27-30.) Thus, there was no dispute that Qualcomm's double-balanced mixers generate the baseband, as they had in the prior art. (A2080 ("The mixer downconverts the RF signal to baseband signal."); A11126:1-2.) Qualcomm was not required to call additional witnesses in the liability phase to say what Prucnal had already conceded.³¹

As the district court observed, ParkerVision did not offer simulations or other scientific evidence, and ParkerVision offered only Prucnal's

³¹ In the second phase, Qualcomm presented testimony further confirming what Prucnal had admitted and Qualcomm's documents showed in the first phase—the baseband is created by the double-balanced mixer *before* the TX filter, and the TX filter and its capacitor has *no effect* on the baseband. (A12168-76.) ParkerVision did not object to, cross-examine, or disagree with that testimony.

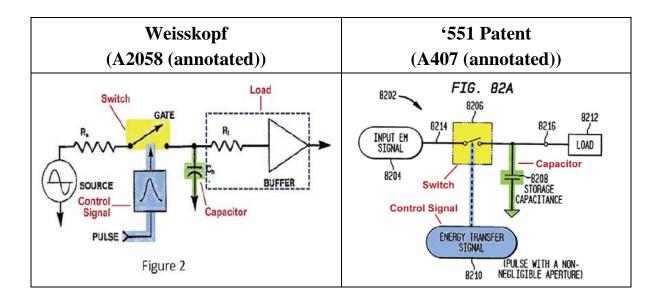
"conclusory," vague, and inconsistent opinion "[t]hrough largely leading questions on direct examination." (A24-25; A28-30.) Under the circumstances, the district court did the only thing it could do, and acted well within its discretion. *Moxness*, 891 F.2d at 893 (affirming new trial where "[t]he district court assessed the demeanor and credibility of [plaintiff's expert] and concluded that his testimony could not be reconciled with the documentary evidence").

VI. ARGUMENT—QUALCOMM'S CROSS-APPEAL

- A. The District Court Should Have Granted JMOL of Anticipation and a New Trial in the Alternative.
 - 1. Qualcomm Provided Unrebutted and Unimpeached Evidence that Weisskopf Anticipates.

Weisskopf published his paper in 1992, long before the critical date.³² (A2057-63; A5655, ¶72.) Weisskopf disclosed the same components and configuration as ParkerVision's purported invention:

³² Qualcomm counterclaimed for a declaration of invalidity. (A8508-10.) Qualcomm preserved JMOL of invalidity by moving before the verdict (A7490-7508) and renewing its motion after the verdict (A5078-5107).



Weisskopf also taught the same alleged innovations over the prior art: a long sample time, a large capacitor, and (although it is not required by the claims) a discharge/low-impedance load. (*Compare* BB13, BB16 (purported invention "would close the switch for a much longer interval and use capacitors that hold and discharge more energy"), *with* A2060 ("sampling aperture is one-half the period"); A2059 (circuit achieves "optimum performance with a larger capacitor"); A2059-60 (analyzing both "high impedance" and "low impedance" embodiments).) The Patent Office did not consider Weisskopf. (A32; A11236:19-22.)

During trial, Qualcomm's expert presented a comprehensive analysis comparing each element of the asserted '551, '518, and '371 claims to the Weisskopf reference. (A11141:8-11199:10.) Razavi testified that the

reference itself was clear and disclosed all of the elements. (*Id.*) In addition, he performed computer simulations to demonstrate for the jury how Weisskopf operates and how it generates the baseband signal from energy in the capacitor. (*Id.*) His testimony and analysis was "uncontradicted and unimpeached." *Integra*, 496 F.3d at 1345.

The district court found that Qualcomm made "compelling arguments," but declined to invalidate the patents-in-suit. (A36.) As detailed below, the district court erred in failing to grant JMOL of invalidity.

a. The Jury Had No Basis to Disbelieve the References Themselves and Razavi's Testimony.

At trial, ParkerVision called no invalidity witnesses. Instead, ParkerVision raised an erroneous claim construction argument, contending that the asserting claims require the down-converter to generate the low-frequency baseband signal by *discharging* the capacitor into a low impedance load. (A35-36 & n.34; A5061-62.)

Even if discharge were required, Weisskopf disclosed it. As Razavi explained, Weisskopf discloses *two alternative embodiments*, one with discharge and one without. (A11146:22-11148:25; A11181:5-11183:16; A11365:8-11366:14.) Weisskopf depicts the results from the no-discharge embodiment in Weisskopf's Figure 1(b) and the results from the discharge

embodiment in Figure 5, showing the down-converted baseband signals in both time and frequency domain representations. (A2058; A2060.) Although Weisskopf states that the alternative embodiment's baseband signal is weaker by comparison to the primary embodiment, it indisputably disclosed *both* embodiments, and therefore anticipates. (A11146:22-11148:25; A11181:5-11183:16; A11365:8-11366:14.)

Nothing in any of the claims requires discharge, but ParkerVision hired Weisskopf and had him sign a report (never introduced into evidence) stating that his paper taught away from discharge and therefore did not teach the invention. (A35n.34.) Before trial, the district court rejected ParkerVision's argument, holding that the "generating" limitations do *not* require the capacitor to discharge:

[T]he language used is not so restricted. ... [A] signal could be "generated" from a charge held in a capacitor either directly, by discharging the capacitor, or indirectly, by measuring the voltage across the capacitor. The language used in the generating claim limitation does not distinguish between these two techniques.

(A74.) *Exergen v. Wal-Mart*, 575 F.3d 1312, 1319 (Fed. Cir. 2009) (rejecting invalidity JMOL opposition based on incorrect claim construction); *Am. Calcar v. Am. Honda*, 651 F.3d 1318, 1341-42 (Fed. Cir. 2011) (same).

ParkerVision did not call Weisskopf or any other rebuttal witness at trial—it could not, as they had all relied on ParkerVision's erroneous "discharge" claim construction theory. Nonetheless, ParkerVision argued that Weisskopf's report "undermines Dr. Razavi's credibility and objectivity" and asked the jury to ignore the uncontradicted evidence of what the Weisskopf paper actually says about the low-impedance embodiment. (A5063; A11476:3-11477:10; A11327:12-11328:13; A11365:8-11366:14.)

ParkerVision's argument contradicted both the law and the record evidence. As this Court has long held, a "reference is no less anticipatory if, after disclosing the invention, the reference then disparages it." *Celeritas Techs. v. Rockwell Int'l*, 150 F.3d 1354, 1360-61 (Fed. Cir. 1998). Weisskopf's assertion that he "taught away" from discharge is thus legally irrelevant to anticipation. It is also irrelevant to the jury's verdict because it is outside the record and directed to an unclaimed feature.

A jury is not at liberty to disbelieve uncontradicted and unimpeached evidence. *Integra*, 496 F.3d at 1344-45. Instead, as this Court has held on many occasions, JMOL is required where the reference itself and the defendant's unrebutted testimony show invalidity. *E.g.*, *Verdegaal Bros. v. Union Oil*, 814 F.2d 628, 632 (Fed. Cir. 1987); *Ecolab v. FMC*, 569 F.3d

1335, 1345-47 (Fed. Cir. 2009) (reversing denial of invalidity JMOL based on unrebutted testimony from defendant's expert); *Celeritas*, 150 F.3d at 1360-61 (reversing denial of JMOL of anticipation where "the Telebit article itself and the testimony offered at trial conclusively demonstrate[ed]" anticipation).

b. Qualcomm's Failure To Object Does Not Turn Attorney Argument into Evidence.

The district court observed that Qualcomm did not object during ParkerVision's closing. (A35n.34.) However, failure to object to ParkerVision's improper closing (or to ParkerVision's misleading cross-examination) does not turn attorney argument into evidence. *Becton*, 616 F.3d at 1260. Weisskopf's expert report was not in evidence at trial, ParkerVision did not call him as a witness, and counsel's improper argument is not evidence. And, as discussed below, Qualcomm sought a jury instruction to correct the misstatement of the law that teaching away applies to anticipation, but the court declined to give that instruction.

Finally, the district court also noted that ParkerVision did not concede that only one limitation was missing from Weisskopf, but none of ParkerVision's arguments defeat JMOL. (A35.) ParkerVision argued that Weisskopf did not transfer *enough* energy to the capacitor, contending that Razavi did not specifically state that the energy in Weisskopf's capacitor was

distinguishable from noise. (A36.) ParkerVision also argued that Weisskopf did not "sample," even though it indisputably does not have a continuous connection between input and output. (A5063.)

Parker Vision's arguments only highlight the fundamental inconsistency between ParkerVision's infringement and validity positions. For infringement, ParkerVision did not present any evidence that Qualcomm's capacitors received any energy from the carrier. In contrast, for invalidity, Razavi presented uncontradicted evidence that Weisskopf "goes through a great deal of detail regarding maximizing the transfer of energy from the carrier signal, from the input to the capacitor." (A11144:8-11145:10.) Razavi testified without contradiction that Weisskopf used carrier energy in the capacitor to generate the low-frequency baseband (that was the entire purpose of the paper)—yet contrary to its infringement argument ParkerVision contends that even that much energy is not enough to meet the claims. (A13132.) JMOL of invalidity is required. E.g., Ecolab, 569 F.3d at 1345-47; Celeritas, 150 F.3d at 1360-61; Verdegaal, 814 F.2d at 632.

c. The Instructions Allowed ParkerVision To Mislead the Jury.

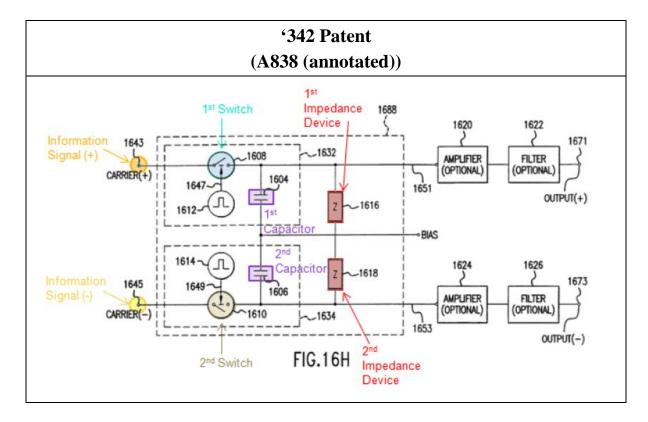
Because ParkerVision argued that Weisskopf taught away from the claimed invention, Qualcomm sought to instruct the jury on the well-

established doctrine that disparagement is irrelevant to anticipation. The district court denied Qualcomm's request. (A11416:17-11417:19.) ParkerVision took advantage of the absence of a disparagement instruction, cross-examining Razavi by suggesting and arguing in closing that the jury should disregard Weisskopf entirely. (A11476:3-11477:10; A11327:12-11328:13; A11365:8-11366:14.) The court recognized that, "[i]n hindsight, and especially given ParkerVision's closing arguments," a "disparagement instruction[] would likely have been appropriate." (A37.) That omission alone is a sufficient basis for a new trial, because the instructions gave the jury "a misleading impression or inadequate understanding of the law and the issues to be resolved." Stuckey v. N. Propane Gas, 874 F.2d 1563, 1571 (11th Cir. 1989). (A11543:13-11545:3.) Given the key importance of Weisskopf to Qualcomm's invalidity case, the district court should have ordered a new invalidity trial, both due to the instructional error, and because the verdict was against the great weight of the evidence.

2. DeMaw Anticipates '342 Claim 18.

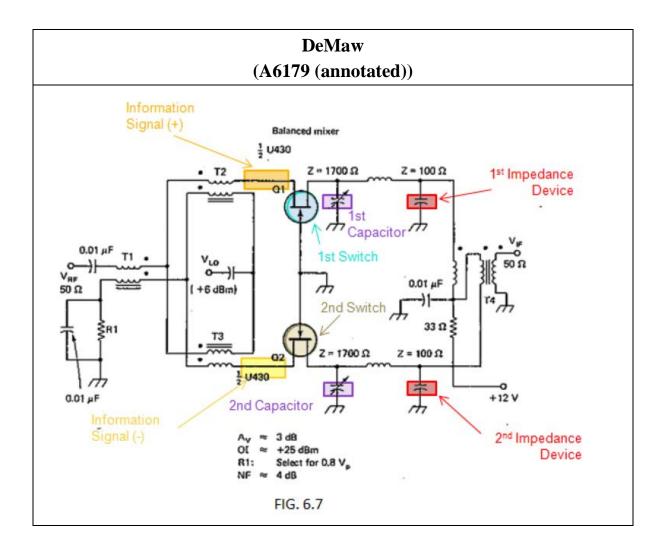
In addition to the ten asserted claims from the '551, '518, and '371 patents, ParkerVision asserted claim 18 from the '342 patent. Claim 18 addressed ParkerVision's energy sampling in a "differential" configuration—

i.e., claim 18 has two side-by-side versions of the energy sampler.³³ Figure 16H of the '342 patent is an example of a differential circuit.



The DeMaw reference anticipates claim 18 of the '342 patent. DeMaw was published long before the critical date of the '342 patent. (A6161-62; A5656, ¶83.) As Razavi explained in extensive detail, Figure 6.7 of the DeMaw reference teaches the same components as the claimed configuration in '342 claim 18. (A11240:9-11264:21.) The Patent Office did not consider DeMaw. (A32; A11264:19-21.)

³³ A differential configuration is not a double-balanced mixer; rather, it has two parallel paths that are the mirror image of each other and lack the crisscross that is the hallmark of a double-balanced mixer.



ParkerVision offered no rebuttal. Instead, ParkerVision argued that DeMaw did not anticipate because it "generated" the down-converted low-frequency signal on the line *before* the capacitor. (A5068.) ParkerVision's argument highlights the inconsistency between ParkerVision's infringement and validity positions and again confuses the distinction between current-mode and voltage-mode signals. Like the ParkerVision patents (and unlike the accused current-mode devices), DeMaw employs a *voltage* signal. Thus,

for DeMaw, the signal voltage is the same both at the output of the switch and the top plate of the capacitor and by "[c]harging the capacitor with an arrow through it and discharging it, we generate a down-converted information signal." (A11258:5-9.)

Finally, ParkerVision also contended in passing that Razavi did not model DeMaw correctly, but Razavi's testimony regarding the simulations is unrebutted. JMOL of invalidity and a new trial in the alternative was also required for DeMaw. *E.g.*, *Ecolab*, 569 F.3d at 1345-47; *Celeritas*, 150 F.3d at 1360-61; *Verdegaal*, 814 F.2d at 632.

B. The District Court Should Have Conditionally Granted Qualcomm's Motion for JMOL and a New Trial on Damages.

The district court did not reach Qualcomm's post-trial damages motions,³⁴ denying them as moot. (A38.) Although this Court should affirm without reaching damages, the district court should have also conditionally granted Qualcomm's motion for JMOL and a new trial on damages.

³⁴ Qualcomm preserved its damages-related motions as to the royalty base, rate, and Benoit's opinions. (A1111-42; A5265-97; A39-53; A5000-24; A11586:4-11600:2, A11611:14-11613:22; A5109-39.)

1. ParkerVision's Demand for a 50% Royalty Rate Misapplied Nash Bargaining Theory.

This Court recently "rejected invocations of the Nash theorem without sufficiently establishing that the premises of the theorem actually apply to the facts of the case at hand" as use of "an inappropriate 'rule of thumb." VirnetX v. Cisco, 767 F.3d 1308, 1332 (Fed. Cir. 2014). ParkerVision's accounting expert, Benoit, invoked Nash bargaining. But his analysis consisted solely of citing the Nash Bargaining Solution for the proposition that "if two parties have equal bargaining position, that they would split the surplus benefit of reaching that bargain evenly." (A11772:1-5.) He then showed the jury a picture of the Nobel Prize Medallion that Nash received for a complex and mathematically advanced game theory.

Benoit provided no analysis or testimony applying Nash bargaining methodology to the facts of the case. Instead, he simply declared that it would be "logical" for Qualcomm to pay ParkerVision 50% of its allegedly "excess" profit—\$432 million—opening the door to the jury's \$173 million damages award. (A11757:11-17.) *VirnetX*, 767 F.3d at 1333 (use of "50/50 baseline ... run[s] the significant risk of inappropriately skewing the jury's verdict"). But Benoit did no analysis and presented no evidence that the parties had an equal bargaining position. He just assumed it. In fact,

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ParkerVision had no leverage over Qualcomm. By the time of the first alleged infringement in 2006 (unlike 1998-99), Qualcomm had already designed its own direct down-conversion for cellular CDMA and had been selling hundreds of millions of dollars of those non-accused, direct down-conversion receivers for years. (A11841:13-25; A11844:4-18.) In sum, Benoit's opinion reduced to a mere 50/50 presumption—"just such an inappropriate 'rule of thumb'" that this Court recently rejected. *VirnetX*, 767 F.3d at 1332.³⁵

2. ParkerVision's Demand for a Royalty Base of More than 90% of Qualcomm's Receiver Profits Contradicted the Record and this Court's Precedent.

ParkerVision and Benoit also presented an improper royalty base. They told the jury "that since 2006, Qualcomm has made *more than a billion dollars in extra profit* from using the invention." (A11629:17-21 (emphasis added).) But as this Court has repeatedly emphasized, "[t]he law requires patentees to apportion the royalty down to a reasonable estimate of the value of its claimed technology, or else establish that its patented technology drove demand for the entire product." *VirnetX*, 767 F.3d at 1329; *Uniloc USA v*.

ParkerVision claims that in 1999 it left an offer from Qualcomm on the table that "would have resulted in an estimated in royalties to ParkerVision." (BB23.) But Qualcomm never made any such offer. (A10634:4-10635:19; A10641:14-20.)

Microsoft, 632 F.3d 1292, 1318-20 (Fed. Cir. 2011); LaserDynamics v. Quanta, 694 F.3d 51, 67 (Fed. Cir. 2012); Lucent, 580 F.3d at 1337. Such proof must account for the defendant's "manufacturing process, business risks, or significant features or improvements." Lucent, 580 F.3d at 1332-33.

Determining the relative value of the patented feature was particularly important here, because the claimed invention is at most an alleged improvement modestly adjusting the function, but not the structure, of a priorart circuit, and even then, only a tiny part of the accused devices, comprising less than 1% of the receiver. (A11856:4-10; A11822:6-8; A11865:1-11.) The claimed invention in this case is uniquely minimalist in every respect. Indeed, Qualcomm presented uncontradicted and unimpeached testimony that the accused capacitors have no effect on the baseband and are not needed to generate it. (A12168-76.) The record also established that to make the accused CDMA receivers, Qualcomm needed to solve many problems that the invention does not address, including the TX jammer problem—"one of the major challenges and complexities" of CDMA. (A10979:16-10980:11; A10985:11-13 (ParkerVision's alleged invention "doesn't solve the TX jammer problem").) Qualcomm had to combine that solution with at least

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nine other "critical" technologies, all of which Benoit and ParkerVision ignored. (A12178:9-12183:23.)

Benoit admittedly made no "effort to go through and understand" Qualcomm's contributions. (A11879:19-11880:1.) He did not know what non-patented technology Qualcomm included in its receivers, much less account for its contribution to Qualcomm's profits. (A11879:4-11884:11.) He had "no actual idea" how much time and money Qualcomm spent implementing the technology at issue. (A11863:3-11864:6; A11886:12-15; A11887:9-22.) He did not investigate the difficulty in making the technology at issue work with Qualcomm's basebands, and did not factor that into his analysis in any way. (A11807:17-11808:1.)³⁶ He simply assumed that Qualcomm's intellectual property, trade secrets, and know-how are not responsible for any of Qualcomm's receiver profit. (A11884:7-11 ("[N]one of those were credited with any allocation or portion of the 90 percent profit on the receiver sales.").) Oblivious to the facts, he assumed a fictional world.

ParkerVision and Benoit also failed to account for the most significant factor driving Qualcomm's receiver sales—the demand for Qualcomm's

³⁶ Qualcomm has between working on the proprietary and sophisticated interface between its transceivers and the baseband chip, including hardware and software algorithms. (A12158:1-12160:6.)

advanced multi-functional, multimedia baseband chips. (A11837:3-11838:19.) The baseband is the heart of the cellular device. (A12155:12-24.) The unrebutted testimony established that "what was really driving [OEM customer's] purchase decisions were the features and functions of the baseband chip and not the functionality of the receiver chip." (A12070:14-12071:21.) Benoit admitted that he did not know what the digital baseband was, much less attempt to understand its importance to 2G, 3G, and 4G technology. (A11885:1-8.) That admission is like conceding, in a patent case concerning a car, that he had no understanding of an engine or how it might be important in valuing a car.

In sum, ParkerVision's grandiose claims and Benoit's opinions were at least as inflated and divorced from reality as any of the overstated claims rejected by this court in *VirnetX*, *LaserDynamics*, *Uniloc*, and Benoit's testimony should have been excluded. If the district court had reached Qualcomm's damages motions, it should have granted JMOL and a new trial on damages; no reasonable jury could have awarded anywhere near the amount that ParkerVision requested. *Tronzo v. Biomet*, 236 F.3d 1342, 1345-47 (Fed. Cir. 2001). At a minimum, a new damages trial is required if the Court affirms the judgment in part on either noninfringement or invalidity.

VII. CONCLUSION AND STATEMENT OF RELIEF SOUGHT

For the foregoing reasons, Qualcomm respectfully requests that the Court affirm the judgment of noninfringement and reverse the denial of Qualcomm's motion for JMOL of invalidity. Although the Court need not reach damages, if it does, the Court should grant Qualcomm's motion for JMOL and a new trial.

Respectfully submitted,

Dated: November 20, 2014

/s/ Timothy S. Teter

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UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

ParkerVision, Inc. v. Qualcomm Incorporated, Nos. 2014-1612, -1655

Certificate of Service

I, Elissa Matias, being duly sworn according to law and being over the age of 18, upon my oath depose and say that:

Counsel Press was retained by COOLEY LLP, Attorney for Defendant-Cross-Appellant to print this document. I am an employee of Counsel Press.

On **November 20, 2014**, counsel has authorized me to electronically file the foregoing **Principal and Response Brief of Defendant-Cross-Appellant Qualcomm Incorporated** (Confidential and Non-Confidential versions) with the Clerk of Court using the CM/ECF System, which will serve via e-mail notice of such filing to any of the following counsel registered as CM/ECF users:

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By agreement between the parties, the confidential version will be served via email on the above counsel on this date. Additionally, two paper confidential copies will also be mailed to counsel on the same date copies are sent to the Court.

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November 20, 2014 /s/ Elissa Matias
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